

ABSTRACT

Title of Document: A SYNTACTIC STRUCTURE OF LEXICAL VERBS

Nobue Mori, Ph.D., 2005

Directed By: Professor Juan Uriageraka, Department of Linguistics

In this thesis, I propose a syntactic structure for verbs which directly encodes their event complexities. I present a model that is ‘internalist’ in the Chomskyan sense: Aktionsart properties of predicates are not a real-world affair, but the interpretation of a mind structure. For this purpose, I base my proposal on the Dimensional Theory of Uriageraka (2005, forthcoming). Syntactic constructs are in this view the results of operations that create increasingly complex objects, based on an algorithm that is homo-morphic with the structure of numerical categories.

First, I propose that Aktionsart can be read off from structural complexities of syntactic objects and their associated ‘theta-roles’. Specifically, I present the SAAC Hypothesis: Syntactic complexity in a verb is reflected in the number of syntactic arguments it takes. This approach, within the confines of the Dimensional Theory, results in an emergent ‘thematic hierarchy’: Causer > Agent > Locative > Goal > Theme. I test the accuracy of this hierarchy and concomitant assumptions through paradigms like the control of implicit arguments, selectional properties of verbs,

extractions, aspect-sensitive adverbials, etc.

Second, I argue that the verbal structure I propose is syntactically and semantically real, by extending the proposal in Lasnik (1999) on VP ellipsis from inflectional to derivational morphology. I discuss two contrasting methods of morphological amalgamation in English and Japanese, executed in Syntax and PF, respectively. This demonstrates a tight network of entailment patterns that holds of verbs, derived crucially from the architecture I argue for.

Third, an analogous point is made through the structural positionings of causative and inchoative derivational morphemes in Japanese. There, each order of structural complexity has a profound impact on the class of eventualities a derivational morpheme can describe. ‘Dimensional talks’ are observed between certain derivational morphemes, which presumably find their roots in operations of the computational system within the Dimensional Theory. I show that the verbal structure in Japanese reflects directly an underlying bi-clausality that I argue for, in terms of derivational morphemes, further supporting a natural mapping between syntax and semantics.

This is, in the end, an attempt for a ‘Minimalist’ theory of Aktionsart.

A SYNTACTIC STRUCTURE OF LEXICAL VERBS

By

Nobue Mori

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Advisory Committee:
Professor Juan Uriagereka, Chair
Professor Paul Pietroski
Professor Howard Lasnik
Professor Norbert Hornstein
Associate Professor Mary Ellen Scullen

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Dedication

To my parents, Mitsuko and Masakuni Mori,
for the kind of people they are, and their unconditional love.

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First and foremost, I would like to thank the Great power of the universe, whose presence I feel in every breath I take. I would like to thank my parents, Mitsuko and Masakuni Mori. Without their help, trust, understanding, and unconditional love, I couldn't have made it. If I can be one-tenth of a good person as they are, then my aim in my life is completely fulfilled. I would truly like to express my heartfelt gratitude to them. Thank you so much for walking right beside me, side by side, for every minute for all those years.

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Chapter 1: Introduction.

This thesis proposes a new syntactic analysis for verbal specifications, within the general confines of the Minimalist Program (MP). In standard generative treatments a lexical verb consists of a bundle of features, which specify syntactic, semantic, and phonological peculiarities of the verb. The syntactic features are taken to be utilized by some computational system that combines the lexical (here verbal) matrix with other elements in syntactic derivations. I assume this computational system to be essentially Chomsky's C_{hl} (Chomsky 1992, 1994, 1999, 2000). To be deliberately naïve about the matter, that then poses an immediate question. Is any syntactic principle, of the sort delimiting C_{hl} , operative *inside* the lexical domain, that is, within the feature bundle that determines it?

Two opposing answers to that question are given in the literature: (a) there is no syntax operating inside a lexical verb, and (b) some syntax is indeed involved in the structuring of a lexical verb. Route (b) splits into two sub-answers, depending on what kind of syntax is taken to be operative within the lexical structure of a verb. Some claim that the syntax operative inside a lexical verb is of a different species, vis-à-vis the one operating in narrow syntax. Others, in contrast, propose that only one kind of syntax is involved inside and outside the structure of a lexical verb. In this thesis, and with some qualifications, I will be taking essentially the latter position. In particular, I will be showing the advantages of taking sublexical components of a verb to be ruled by fully operative narrowly syntactic mechanisms. That is, what we may think of as 'lexical syntax' is in effect part of narrow syntax.

Just how much syntax is involved inside the structure of a lexical verb essentially depends on how much syntactic decomposition one assumes inside a lexical domain, more generally. In this, I follow Baker (1996), McClure (1995) and Butler (2004), *inter alia*, who propose articulated syntactic structures for lexical verbs, and demonstrate that narrow syntax is indeed present in the lexical structure of verbs.¹ Like them, I propose a structure of lexical verbs which, in ‘vertical’ paradigmatic terms, progressively increases its complexity. This syntactic complexity parallels a corresponding interpretive complexity in the Conceptual/Intentional (CI) component, specifically in the event being denoted by the verb. I diverge from these authors, however, on one aspect: the mapping of elements bearing certain thematic roles to their syntactic positions inside a lexical verb. Specifically, there is no (significant) mapping *per se* in my proposal, and yet the syntactic positions of ‘theta-bearing’ elements that I explore are actually considerably more rigid than what they propose. I explain next why this is.

1. 1. A Layered Structure for Lexical Categories.

First, I adopt the Dimensional Theory in Uriagereka (1995, 2002, forthcoming) as an underlying syntactic assumption. In this proposal, lexical items project in accordance to a certain inductive algorithm that I discuss in the next subsection.

¹ This view of things admittedly stems from the generative semantics tradition of the 1960’s. My view, however, is markedly different from that perspective, for reasons that I return to in chapter 7, as discussed also, for the larger ‘dimensional’ theory that I am assuming, in Uriagereka (forthcoming).

Based on this inductive system, the structure of a lexical verb increases its syntactic complexity, which is in turn construed as an event with a matching complexity in the CI interface. Crucially, each layer of inductively generated structure is dimensionally and hence qualitatively, different from the previous, less complex ones, in the Dimensional Theory. In this framework, what syntax does is just to crank up structures of varying orders of complexity, according to a certain format that involves what is customarily referred to as ‘theta roles’, in a way that I come back to. As such, said ‘roles’ are essentially generators of the progressively more elaborate syntactic orders of complexity. This is significantly different from, for example, what Baker proposes, inasmuch as he assumes *independent* conceptual notions of theta roles, and keeps them separate from the syntactic notions of ‘object’ or ‘subject’ via extra-linguistic and purely arbitrary mapping conditions, along the lines of his Unified Theta Assignment Hypothesis (UTAH). For Baker, UTAH is external to the narrow language faculty.² The Dimensional Theory, in contrast, involves specifically syntactic structures whose obligatory dependents necessarily reflect the complexity of events (at the CI component) due to the induction processes that C_{h1} determines. As such, theta roles are nothing but convenient labels.

To put it in other words, there is no (non-trivial) arbitrary mapping per se between the theta roles and the syntactic positions in the Dimensional Theory. An obligatory

² That is, the fact that, say, agents are universally projected in a position higher than themes, for instance, doesn’t follow from primitives that are specific to the language faculty, and has to be assumed to be the consequence of other cognitive limitations. I will attempt a different approach here: that the relevant mapping is forced by considerations internal to the faculty of language, when interpreted in minimalist terms.

syntactic element contributing to generate a structure of a certain complexity is automatically interpreted as a matching ‘theta-role’-bearing element. This is so because of a major idea that I will assume without argument: An event of a certain degree of semantic complexity owes this conceptualization to a corresponding syntactic complexity.³ The main focus of this thesis is that, once that assumption is made, we don’t need a *separate* assumption about how theta-roles map to syntactic structures: the elements that are construed as ‘theta role’-bearing are directly responsible for the eventive structuring. In other words, Vendler’s Hierarchy of eventive complexity mirrors the Thematic Hierarchy (see below for more on both of these notions). One can debate Uriagereka’s effort to have Vendler’s structuring system follow from fundamental conditions on how semantics is read off of syntax, but my proposal is more modest: *if* that thesis is assumed, then a separate, specifically thematic, hierarchy becomes superfluous. To the extent that I succeed in providing empirical support for this specific position, the presupposition based on Uriagereka’s work is also strengthened. But it should be said, also, that if my project in the end fails, the Dimensional Theory could still be true, albeit surely in a less straightforward form than the one I explore here.

In a sense, the system I propose is similar to what Baker describes as a ‘radical form of UTAH’ (Baker 1997: section 5). Baker envisions a syntactic system where Conceptual Structure *is* the necessarily assumed LF, thereby eliminating a great amount of redundancy in his system. The only (important) difference between that

³ That is given a class of primitive (base) predications which I have nothing to say about here. See Uriagereka (forthcoming) for a broad justification of this view.

view and the Dimensional Theory pertains to the fact that the latter takes LF to be a purely intentional semantic system based on mildly context-sensitive syntax, mapped *from* a purely conceptual semantics based on context-free syntax. In other words, in this theory there is no single, unified, CI component, but rather a C (lexico-conceptual) component *feeds* into an I (referential-intentional) component.

Uriagereka (forthcoming) takes that to be an essential step in deducing the specifics of the syntax/semantics correspondence that he postulates when working out his take on the Vendler hierarchy. That said, it remains true that the structuring dictated by this ‘radical form’ of something very much like UTAH also *makes it* to LF in the form of characteristically arranged syntactic structures, which have a direct bearing on possible and impossible semantic inferences.

1. 2. Understanding the Thematic Hierarchy: The SAAC Hypothesis.

My particular take on the Dimensional Theory, when applied to verbal specifications, and concretely my view that it turns the Thematic Hierarchy into a side-effect, directly leads us to expecting the absolute rigidity of syntactic positions of theta role bearing elements. Again, Vendlerian event complexities result from the direct interpretation of corresponding syntactic complexities in that aspect of the Dimensional Theory that I have nothing to contribute to (other than supporting evidence for it, see chapters 2-6 below). What interests me here is that, if my conjecture about theta-roles is correct, then the syntactic positions of elements that are interpreted as bearing particular thematic roles in the CI component(s) should be

fixed. This is what I call the Syntactic Argument and Aktionsart Correlation (SAAC) Hypothesis, which I explicitly state in chapter 2.

For example, if I am correct, there should be no two structures with the same amount of syntactic complexity and yet different theta roles involved in analogous structural positions, or two structures with the same theta roles and different eventive complexities.⁴ This is in sharp contrast, for example, to one of Baker's contentions that there are only two syntactic positions of *relative* structural prominence –an internal argument and an external one⁵. As it will be clearly spelled out below, syntactic arguments play a crucial role in creating structures of differing degrees of complexities in my take on the Dimensional Theory. The syntactic arguments (I only deal with DP/NPs in this thesis) involved in creating each of those structures are interpreted as bearing certain *specific* 'theta roles' in the CI component. The net effect of this is that syntactic positions of argument DP/NPs (that is, the 'theta role'-bearing elements) are fixed, and of course much more fine-grained than just 'internal' or 'external'. That is simply because the Vendlerian organization of sub-events clearly involves more than just those two 'cuts', a matter that I will concern myself with deriving (See chapter 2).

⁴ Theta-roles are classified into five groups in this thesis. Then to spell things out more accurately: if two structures have the same degree of syntactic complexity, then they have no element which occupies the same structural position and yet bears a theta role *from two different theta role groups*.

⁵ Baker (2003) virtually endows verbal heads with two arguments, one external and one internal. The goal argument is present in a lexical VP, only by way of the lower V head selecting an AP.

More concretely, the syntactic structure I propose for verbs within the overall confines of the Dimensional Theory decomposes this lexical space into a maximal of *five* verbal layers of projections that rather directly mirror the complexities of verbal predicates expressed in traditional ‘Aktionsart’ (cf. Vendler 1967, Dowty 1972, Tenny 1987, Pustejovsky 1991, inter alia.)⁶ Each layer of verbal projections is syntactically real and one specific class of thematic relation is expressed at each layer of verbal projections, as the syntax creates a progressively more complex structure with more layers of verbal projections. That is how syntactic positions for a certain theta role come to be absolute and fixed. For example, the structure I propose for a lexical verb *build* is roughly as follows:

1. [_{VP5} Causer [_{VP4} Agent [_{VP3} Locative [_{VP2} Goal [_{VP1} Theme]]]]]]

As in 1, the structure has five ‘layers’ of verbal projections inside the lexical verb *build*. The syntactic positions of each of the elements interpreted as bearing certain theta roles at the CI component(s) are fixed and rigid. They, in effect, can be stated as syntactic arguments of a specific nth layer of the VP. For instance, a syntactic argument involved in building the VP2 must be interpreted as a Goal for the 5-layered VP. Observe incidentally how the first verbal projection of *build* is merged with a

⁶ Although this is compatible with Uriagereka’s specific proposal in (1995) and (2002: chapter 15), it is also rather more specific. Yet it should be clear that one thing is the organization of events (here, into five layers) and a different one, in principle, how or even whether theta roles contribute to this organization. The latter is the novel view that I explore, which depends on the Dimensional Theory, though not vice-versa.

Theme DP, the second, with a Goal DP, the third, a Locative DP, and so on, to create a verbal projection with five ‘layers’, or dimensions, of complexity (see chapter 2 on this general point). This five-layered lexical verbal category as a whole denotes an event the lexical verb *build* describes in the CI component. To make this picture clear, let me now specifically outline my proposal.

1. 3. Some Specifics of the Main Proposal.

I assume that the internal complexities of eventualities are directly encoded in syntax, and more concretely that the constructive history of the relevant syntax directly determines a corresponding network of semantic entailments, so that more complex event types imply less complex event types. That is, in a nutshell, the Dimensional Theory. But in addition I make the substantive proposal that the more complex events require *a greater number of event participants* than the less complex ones, and moreover that those event participants are realized *as syntactic arguments*. This is the essence of my SAAC Hypothesis. I take (or at least hope) this requirement to have formal force: it is *because* of these argument/participants that the ensuing lexical/eventive complexity in the VP is appropriately articulated. Simply put: No arguments, no eventive complexity –more arguments, more eventive complexity.

As per the Dimensional Theory, the types of eventualities we express as Aktionsart define some implication relationships *from the more complex to the less complex* event types, as a consequence of sheer, trivially paralleled, syntactic

complexity. I pursue the possibility that the computational system of human language provides a certain format to interpret these eventualities, as a consequence of the particular syntactic arguments they take, which can then be characterized as Agent, Theme, etc.⁷ The implicational relationship among the sub-eventualities that are comprised in any given event, organizing it in characteristic fashion, is captured within the Dimensional Theory in a way that does not require ad-hoc meaning postulates to the relevant effect (e.g. stipulations as in Dowty, Wall, and Peters 1992, Dowty 1979 Chapter 3). As such, when I make reference to an ‘event’, this is to be understood as a reflection of layered complexities provided by verbal syntactic structures interpreted in the CI component(s). Also, throughout this thesis, I use the term ‘Aktionsart’ and its four verbal classes – States, Achievements, Activities, Accomplishments– to denote the internal complexity and telicity of the various sub-events generated in the system, basically as an expository convenience (Dowty 1979, Chapter 2).⁸

Again, in the same vein, I take the view that thematic roles such as Agent or Theme are not linguistically primitive (Dowty 1989, Chierchia 1989), but are instead convenient labels for the way in which syntactic arguments relate to given predicates,

⁷ See the special status assigned to Theme in chapter 2.

⁸ In this work I only discuss lexical verbs, not complex predicates or predicates with prepositions. Of course, in principle similar issues arise for the latter, but this is beyond my scope here.

all of which is determined structurally.⁹ This is all contra those views that presuppose an explicit and separate ‘thematic hierarchy’, and some corresponding mapping between the hierarchy in point and syntax (Jackendoff 1972 inter alia). My novel claim, the SAAC Hypothesis, is that Aktionsart is directly reflected in the number of arguments a predicate takes in a VP. Importantly, in order to stick to that overall goal, in particular for those verbs where this is not obvious, I must assume that some of those arguments will be realized as, in particular, a locative phrase, or even an incorporated element, as we will see. In any case, my intention is to have the Thematic Hierarchy of predicates in Jackendoff (1972) to trivially fall out of this claim –in effect reducing it to the more basic Vendlerian hierarchy of Aktionsart. I take this to be a rather natural consequence of assuming the Dimensional Theory as providing the underlying syntax.

Let me now turn to explicate the essentials of the Dimensional Theory inasmuch as they pertain to my SAAC proposal. Traditionally syntax is concerned with ‘horizontal’ or syntagmatic relations among categories, in customary ways. But of course syntactic relations are known to also be vertical or *paradigmatic*. Paradigmatic relations manifest themselves in various ways, for instance in terms of lexical paradigms (verb, noun, adjective, preposition) or implicational relations among categories within given paradigms (if Jack boils the soup, the soup boils). The question is how to capture these, and how the mechanism we employ relates to other mechanisms we need for more standard horizontal relations.

⁹ For expository purposes, however, I will use customary Agent, Theme, and similar labels.

Typically, some of these notions are captured (I would say even re-coded) by way of mechanisms that are outside standard syntax. For instance, binary feature geometry for attributes like ‘N’ or ‘V’ is taken to provide the combinatorial options for the syntactic atoms ([+V, -N] is a verb, [-V, +N] is a noun, [+V, +N] is an adjective, [-V, -N] is a preposition). In turn, lexical entailments are customarily stipulated to the effect that they hold, period. That stipulation can be direct (as in so-called Meaning Postulates) or indirect, then being blamed on some extra-linguistic ‘hierarchy’ of the right (i.e. observed) shape. In the latter instance, well-intentioned and very powerful correspondence rules between the syntax and the extra-linguistic ‘hierarchy’ do the job, albeit in a completely unprincipled way: aside from stipulating the ‘hierarchy’ itself, *that* it maps in the observed way to the syntax must also be stipulated.

The Dimensional Theory attempts to do away with extra syntactic machinery of that sort: rules for feature combination and defaulting, hierarchical organizations of a mysterious nature, substantive correspondence mechanisms. In the spirit of Hale and Keyser (1993, 2002), this theory takes what amounts to a substantive D-structure (context-free) component of the syntax to be sufficient to express these lexico-conceptual notions, including their hierarchical arrangements and ensuing entailment possibilities. Unlike the guiding work by Hale and Keyser, however, the Dimensional Theory suggests that the underlying syntax has to be slightly more elaborate (and also simpler in some of its assumptions) than is normally presupposed.

Following an intuition that has been always emphasized by Chomsky (e.g. as recently as in his (2005)), Uriagereka compares in (2002: chapter 15) the syntax of natural language to the number system. Unlike Chomsky, however, Uriagereka invites us to explore the potential of the numbering system at large for relevant conceptualization purposes. Numbers are not just natural, but also whole, fractionary, etc.¹⁰ This creates a well-known architecture, which has internal implications to it (a natural number is a whole number, but not necessarily vice-versa: it can be negative; a whole number has a fractionary expression, but not necessarily vice-versa, etc.; see fn. 10). If this formal architecture that the human mind is obviously capable of conceiving *is* the architecture of the language faculty (in particular, its syntax), then at least some of the mapping work that is needed to comprehend a corresponding semantics with implicational form to it may be considerably simplified: those implications can be made to piggy back on the formal implications that the underlying syntax provides (see Uriagereka forthcoming).

In this thesis, then, I will assume, in accordance to the Dimensional Theory, that syntax involves some type of inductive process, furthermore one that generates objects of higher orders of complexity every time we witness the application of some

¹⁰ ‘Natural numbers’ (also called as ‘counting numbers’) are positive integers, which includes {1, 2, 3, ...}. Here, I use the term ‘whole numbers’ to include natural number *plus* 0 (zero); thus, {0, 1, 2, 3, ...}. At any rate, what matters is simply the obvious ‘hierarchical’ fact that with these numbers and their simplest relation (*succession*) one expands on the *type* of numbers involved by simply inverting the generating relation (yielding an inverse succession or *recession*), which yields negative numbers. Similar considerations obtain for more complex operations, which in their inversions yield fractionary numbers, irrational numbers, etc.

crucial operation. Since this operation involves much of the topological wonders that one can witness in traditional *origami*, whereby a two-dimensional space can turn into three-dimensional hollow ‘object’ after mere, clever, successive foldings, I will call the species of induction involved in the Dimensional Theory, ‘topological induction’.

Once again, the complexity of syntactic structures is directly reflected in the complexity of events denoted by those structures. But what does it mean for a syntactic complexity to *reflect* an event complexity, what kind of correspondence is that? In the Dimensional Theory, syntactic objects are projected according to the topological induction. The topological induction contrasts with standard Merge. Merge creates objects with a ‘flat’ structure, so to speak, which Chomsky emphasizes in (2005) by comparing the structure of merged objects to that of natural numbers. That is, C, a result of a Merger of A and B, is fundamentally no different from E, obtained by a Merger of C and D, other than the fact that E is a bit ‘bigger’ (involves more brackets) than C, a subset of C. In contrast, topological induction does not just make ‘flat’ structures à la Merge. A syntactic structure with an n^{th} order of complexity created by the topological induction is ‘qualitatively’ or dimensionally different from the structure with the $n-1^{\text{th}}$ degree of complexity, just as a fractionary number is qualitatively different from a whole number, for instance.¹¹ In terms of what matters for my purposes in this work, each layer of VP objects formed by the

¹¹ The exact formalization of this inductive system is beyond the scope of this thesis (see Uriagereka forthcoming on this).

topological induction qualitatively differs from the others. This particular kind of induction carries a layer of a VP to the next higher dimension of VP, thereby creating an object that is dimensionally (and thus complexity-wise, in a topological sense) significantly different from the previous ones.

1. 4. A (Natural) Mapping to the Semantics.

Once that subtle syntax of varying degrees of topological complexity is articulated, the issue is how to map it to a corresponding semantics. Uriagereka offers the following thought experiment as a way to approaching an answer. Suppose we have two formal objects in front of us: (i) a flat, flexible, unbounded space and (ii) a curved, bounded, doughnut-shaped space generated by identifying the edges of (i) first into a ‘cigar band’ and next the edges of this tube into a ‘torus’. Clearly, (ii) is induced from (i), after given identificational foldings that provide boundaries.

Question: If we were asked to assign each of those formal objects, (i) and (ii), to the unbounded, atelic denotation of a state (e.g. knowing how to race) or the bounded, telic denotation of an achievement (e.g. arriving at the station), what would the correspondence be so that the denotatum is taken to *naturally* denote the denotation?

It would seem perverse to assign the bounded formal space in (ii) to the *unbounded* semantic denotation of the activity, or the unbounded formal space in (i) to the *bounded* semantic denotation of the achievement. I suppose that a syntax/semantics mapping is more natural (basically, more *trivial*) than an alternative

if its central formal features do not do any direct violence to the formal features *in each relevant representation*. Quite simply, in the case just discussed we plainly need a bound for the semantic space and it so happens that the syntactic space, the way we have articulated it, provides one directly as a result of how it is folded (what creates the bound is actually the very folding of the less dimensional space into the higher-order space). In the natural mapping the correspondence is direct, nothing else is needed. If one were to assume what I am taking to be an *un*-natural mapping, one would still need more representational apparatus to code the needed semantic boundary, and furthermore, the boundary that the syntax provides would be entirely useless, lost, if the perverse mapping is assumed. These matters constitute my model story for this thesis.

In the terms just discussed, adopting the topological induction has an immediate merit in offering an answer to a well-known puzzle. Most researchers these days assume, for instance, a syntactic structure where an essentially unaccusative VP is dominated by a transitive *v*P in a mono-clausal (of course, transitive) structure.¹² But why this has to be the case is far from obvious –putting aside reasonable empirical considerations. One can easily imagine a system which lets a VP dominate a *v*P in a mono-clause, if no stipulation barring this geometrically imaginable combination is imposed. Why does it not exist? The topological induction has a direct way to answer this sort of puzzle. A *v*P dominates a VP *because* the former is dimensionally higher

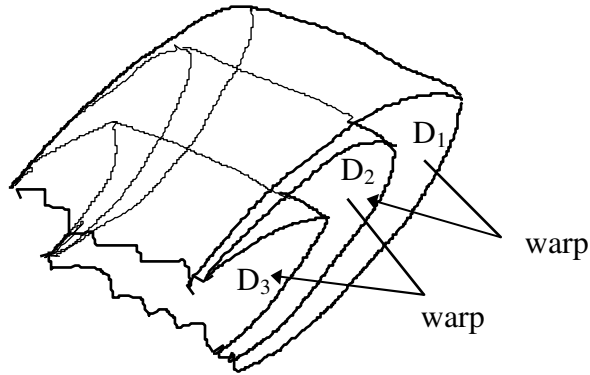
¹² See for instance Chomsky (1995) on this matter. The question that concerns me is why *v*P should happen to dominate VP and not the other way around (or with further intervening categories, etc.)

in complexity, being inductively built on the latter (this is going to be true of all functional categories with regards to their corresponding lexical categories, as discussed in Uriagereka 1995, a matter I will not dwell on here). Moreover, as a consequence of this architecture, and as per the mapping considerations in the previous paragraph, it is then *natural* to expect the denotation of the ensuing *vP* to logically entail the denotation of the VP that went into its construction (e.g. that the transitive *Jack boiled the soup* should entail the unaccusative *the soup boiled*). This is the aspect of the theory that will concern me the most, together with a specific syntactic arrangement that I propose for it.

1. 5. Visualizing the Dimensional Theory.

In sum, in this approach a category is not a primitive, but the result of a computation within a dimension, understood as a lexico-conceptual mental space. Through topological induction, the computation system of human language, C_{hl} , operates on a mental space of dimensionality n , yielding a mental space of dimensionality $n+1$ as a result. Dimensions are, thus, defined inductively. The C_{hl} takes the most basic dimension 1 as the Base, and inductively defines the dimension 2, which in turn serves as the Base for the dimension 3, and so on. Uriagereka (1995, 2002: chapter 15) terms this procedure a ‘warp’ on a dimension, which produces an ‘onion-layer’ sort of topology:

2a.

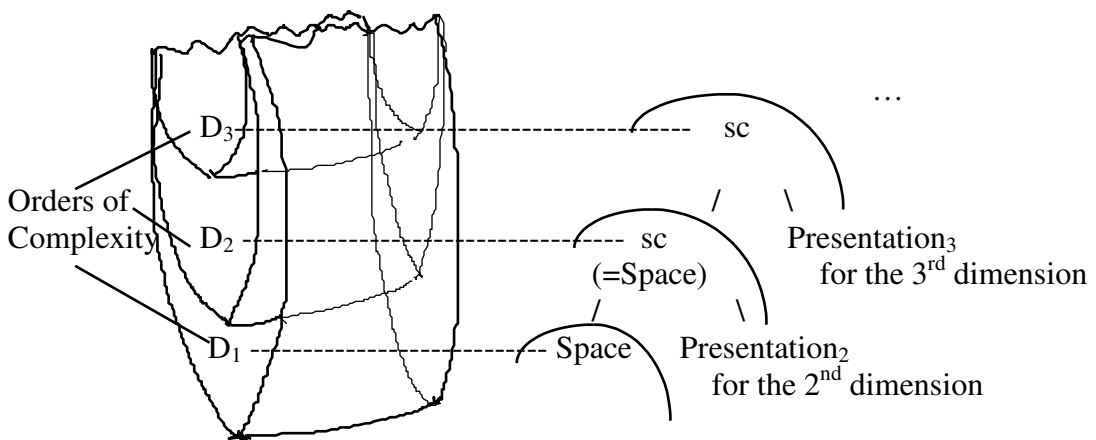


Uriagereka takes the syntax corresponding to this recursive procedure to be the small clause. The predicate of the small clause is called a *Presentation*, and the subject, a (mental) *Space*. We distinguish dimensions in terms of *orders of complexity*, which I will simply notate through an integer that syntactically corresponds to levels of embedding in a direct way:

2b.

Orders of Complexity:

Syntactic Representation:



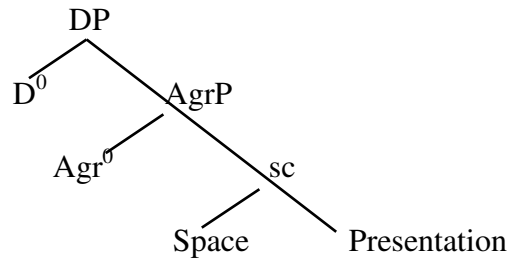
As in 2, a warp is possible only via relating Presentations to Spaces. Thus each dimension has a specific Presentation (e. g. Presentation₂, for the 2nd dimension, and so on). This formalism is observed throughout the syntactic derivations of any category (see e.g. Muromatsu 1998 on nominal spaces), including the verbal projections that concern me here.

In an original move, which I term the SAAC Hypothesis, I take each Presentation to correspond to a syntactically realized argument. Since the topological induction creates syntactic objects with an increasingly complex structure, only an event with a matching degree of internal conceptual structure can be expressed at each dimension of a matching order of complexity. As an implication of this, only certain types of thematic relation are expressible at a specific verbal dimension with a certain order complexity.

All of that concerned the *lexico-conceptual* aspect of the Dimensional Theory, expressed in terms of successively embedding context-free small-clause relations that essentially articulated vertical or paradigmatic syntax. But these notions, in addition, are taken to relate to one another by the ‘relational/possessive’ format explored by Kayne (1994) based on pioneering work by Szabolcsi (1983). This is in order to achieve referential-intentional status, which manifests itself in terms of a more customary horizontal or syntagmatic syntax. Simply put, the small-clause structure relates to two c-commanding functional projections: an AgrP intended to express referential properties for the entire expression, and a DP intended to code

quantificational properties. The D head takes the AgrP as a complement, and the Agr head takes the small-clause as its complement:

3. Basic structure in the Dimensional Theory:



The AgrP is taken by Uriagereka (1998, 2002: chapter 10) to be akin to a ‘number phrase’, roughly in the sense of Ritter (1989), which the quantifier introduced at the DP level binds. Each conceptual term in the small-clause, in turn, can in principle displace to the ‘checking domain’, in Chomsky’s (1995) sense, of either the Agr or the D projection, resulting in a variety of syntactic combinations if relevant syntactic conditions are met (see Castillo (1999) for a detailed discussion). In truth, though, this aspect of the Dimensional Theory does not have a direct bearing on what I discuss in this dissertation.

1. 6. Overview of the Chapters.

Let me now provide an overview of the topics covered in the subsequent chapters. The thesis consists of six more chapters. In Chapter 2, I propose a syntactic structure for lexical verbs, concentrating on the matter of their argument-taking. Chapters 3 to

6 comprise empirical as well as theory-internal arguments for this proposal. Specifically, I first provide some direct, albeit also unrelated, arguments for the specific structures I propose in the next chapter (this is Chapter 3). Next I move to more focused and comprehensive arguments for the proposal. I discuss the interpretation of temporal adverbials in Chapter 4. This is followed by elaborations of the lexical verb structure in two parts: I propose contrasting make-ups for lexical verbs in English and Japanese (Chapter 5), and then I derive nine inchoative and seven causative suffixes in Japanese within the Dimensional Theory (Chapter 6). In Chapter 7 I reflect on some of architectural issues that my take on the Dimensional Theory poses, including why the dimensional hierarchy stops at the 5th dimension. A brief set of concluding remarks follows. I should also say that the data utilized in this thesis is drawn mainly from English and Japanese, essentially because lexical verbs in these two languages exhibit interesting contrasts in terms of the Dimensional Theory, which I want to explore in detail.

Chapter 2: Proposal. The SAAC Hypothesis.

This chapter constitutes the basic statement of my proposal for the structure of VPs, based on the Dimensional Theory. I introduce here the SAAC Hypothesis, or the claim that its so-called *internal aspect* or ‘Aktionsart’ is directly reflected in the number of arguments that a predicate takes. Importantly, some of those arguments are realized (non-obviously) as a locative phrase or an incorporated element, as we will see. My intention is to have the Thematic Hierarchy of predicates in Jackendoff (1972) to more or less trivially fall out of this claim. I close the chapter with a brief summary.

2.1. An Event and Its Syntactic Arguments.

I first clarify the terms I use and assumptions I adopt. For ease of exposition, I take the term ‘Aktionsart’ to refer to four classes of verbal predicates that they are traditionally classified into: State, Achievement, Activity, and Accomplishment (Vendler 1967). As customarily described, ‘State’ denotes a state of affairs involving no change, as in ‘Mary knows John’. ‘Achievement’ denotes an event that involves change, and which terminates instantaneously, as in ‘Mary noticed the spot’. ‘Activity’ denotes an event with no specific end point, as in ‘Mary ran’. Finally, ‘Accomplishment’ denotes an event involving an activity that ‘logically culminates’ with a state of affairs (Pustejovsky 1991: 49), as in ‘Mary built the house’. The event denoted by an accomplishment ends, for example, when the state of affairs ‘the house

exists' is obtained. The logical culmination of 'Mary's act of building' is 'the completion of the house'.

Next I would like to clarify my assumptions in regard to Aktionsart and theta-role mapping. To start with, I assume without argument the involvement of the theta roles that are generally associated with Aktionsart: Causer, Agent, and Theme. My contributions to this matter are reduced to the following: (a) Locatives constitute, in my view, a Presentation for the 3rd (dimensional) VP; (b) I consider three theta role variations for the 2nd (dimensional) VP Presentations: Experiencer or Goal or Benefactive; (c) I take Themes to be the defining characteristics of any verbal space, and thus the Presentation for the 1st (dimensional) VP; and (d) in my approach Causer is seen as the Presentation of the (dimensional) 5th VP, and Agent, for the 4th (dimensional) VP. I will be arguing for the following two 'cuts' in verbal hierarchies, to be made more precise in the discussion below: [Theme, Benefactive/Goal/Experiencer, Locative] on one hand and [Causer, Agent] on the other. That said, the exact order of each theta role in the relevant hierarchy will be: Causer > Agent > Locative > Benefactive/Goal/Experience > Theme.

In this chapter, first of all I propose that Theme is a must for any verb, and thus the Base for the topological induction. Then I claim that specific theta-role variations (Experiencer for the 2D stative and 3D eventive VP, Goal for the 4D Activity VP, and Benefactive for the 5D Accomplishment/causative VP) all involve the 2nd dimensional layer of structure. Concretely, I argue that Benefactives are

Presentations for the 2nd structuring layer within a 5D VP, while Goals are Presentations for the 2nd structuring layer within a 4D VP.¹³ I also show that Locative defines so-called eventive verbs (as opposed to stative ones) as a Presentation for the 3D VP. Eventive verbs include inchoatives, Achievements, Activities, and Accomplishments (cf. Kratzer 1992a, b). In addition, I argue, essentially on plausibility grounds, for the entailment of Agent by Causer, thereby making the latter higher in the hierarchy.

2.2. Aktionsart and the Number of Arguments.

I claim here that the internal complexity of an event, expressed as a consequence of corresponding given syntactic dimensionalities in the theory I am assuming, correlates *with the number of syntactic arguments the event requires*. Very specifically, this idea is stated as the following SAAC Hypothesis:

1. The Syntactic Argument and Aktionsart Correlation (SAAC) Hypothesis:

A lexical predicate with n arguments \leftrightarrow n dimensions.

In the Dimensional Theory, the Presentation (in the sense of (2b) in section 1.5) is realized syntactically. In essence, I come to claim by 1 that each Presentation for a VP is realized as a syntactic argument (i.e., an argument of the eventuality), and I

¹³ In the succeeding chapters, I use ‘Goal’ as a cover term to encompass the three theta roles of ‘Benefactive/Goal/Experience’.

assume that this is crucial in understanding the Aktionsart properties of this VP.

Below, I exemplify this correspondence between the number of syntactic arguments and Aktionsart.

2.2.1. A Note about Nominal Infinitives in Basque .

Given the syntactic realization of the category theory sketched in (2b), section 1.5, the *Base* dimension of the VP should be nothing but a Space with no Presentation, and, hence, according to the SAAC Hypothesis, must involve no argument. I claim that this dimension, in fact, is not materialized as a VP at all. However, I suggest that we can see its (nominal) counterpart in noun infinitivals in a language like Basque.

Infinitivals in Basque can be nominal or verbal, as in 2 below:¹⁴

2a. regular nominal:

Jon-en etxe-a-ren eraikun-**tza**
-gen house-article-gen build-**nominal**
(John's construction of the house)

2b. nominal infinitival:

Jon-en etxe-a(-ren) eraiki-**tze**-a
-gen house-article-(gen/abs) build-**inf**-article
(John's constructing of the house)

2c. verbal infinitival:

Jon-k etxee eraiki-**tze**-a
-erg house-abs build-**inf**-article
(for John to construct the house)

¹⁴ I owe all the Basque examples, and relevant discussion, to R. Echepare.

As in 2a, regular nominals take the nominal suffix, *-tz-*, which is similar to *-tion* in English. In contrast, nominal and verbal infinitivals take the infinitival morpheme *-tze-*, as in 2b and 2c, respectively. In the nominal infinitival, genitive Case is assigned to *Jon* and *etxe-a* (the house) (2b), whereas in the verbal infinitival, ergative and absolutive Case, respectively, are assigned instead (2c). The Case pattern in the verbal infinitival is the same seen in finite sentences.

Nominal infinitivals behave on a par with regular nominals in that they bear Case and allow no extraction of elements from within.¹⁵ I suggest that Basque nominal infinitivals are an instance of the nominal counterparts of the base for defining the VP dimensions. Interestingly, object pro-drop is not allowed in nominal infinitivals, contrary to what we see in verbal infinitivals in an object pro-drop language such as Basque.¹⁶

¹⁵ In Basque, extraction from nominals is unacceptable, even when the nominal is in object position. Contrarily, extraction from clauses is acceptable:

- a. *noren_i esan duzu [t_i istorioak] entzun dituzuela
 who-dat said 3-have-2 stories heard 3-have-2-comp
 (who have you said that you heard stories of?)
 b. nor etorri dela esan duzu
 who come 2-is-comp say 3-have-2
 (who have you said has come?)
 (Uriagereka 1993)

¹⁶ Bear in mind that these are *all* infinitival expressions, indeed manifested without any agreement markings in all instances.

3a. verbal infinitival:

Jon-ek jatea
-erg eating-dat
(for Jon to eat)

3b. nominal infinitival:

Jon-en jatea
-gen eating-dat
(Jon's eating)

It first seems as if the direct objects of both *jatea* in (3a) (to eat) and *jatea* in (3b) (eating) are dropped. However, in the nominal infinitival in 3b, it is crucially implied that 'Jon ate something edible'. This is actually not the case in 3a, which can denote an event, for example, in which Jon literally ate, say, a glass, on a bizarre bet with his drinking pals –and the dropped object can be the glass. In other words, the understood argument in 3b behaves on a par with the implicit direct object in non pro-drop languages, such as English. I follow a suggestion by R. Echepare (personal communication) in that the apparent arguments in nominal infinitivals [e.g., *etxea* (the house) in 3b] are not arguments at all, but in some appropriate sense adjuncts. Then it follows that no pro-drop is allowed in nominal infinitivals; pro cannot be an adjunct.¹⁷

In sum, although we do not have pure verbal structures without arguments (and see below on other predicates), we seem to have nominal counterparts in those circumstances. This is not a necessary assumption, but the very fact that verbs normally require arguments suggests taking this property as a *defining characteristic*

¹⁷ See Cinque (1991) on this general matter. In section 2.2.2 (and section 3.5 in chapter 3), I discuss tests for argumenthood more generally.

of a verb.¹⁸ From that perspective, I claim that verb phrases start from a 2nd Order of Complexity in a ‘warp sequence’, and I call this dimension the 1st dimension *of the VP*.

2.2.2. Constructing the Thematic Hierarchy.

According to the SAAC Hypothesis, a 1st dimensional VP has only one argument. I claim that verbs for the 1st dimension (again, *of the VP*) are stative, one-place predicates such as *exist*, as well as measure predicates such as *weigh*:

4a. God₁ exists.

4b. Bill₁ weighed 200 pounds.

Examples 4a and 4b have one argument each, *God* and *Bill*, respectively. These syntactic arguments are underlined in 4, with the subscripted numeral indicating what order of dimensional complexity they are the Presentations for. *Weigh* in 4b, however, looks as if it has two arguments, *Bill* and *200 pounds*. Given the SAAC I must claim, nonetheless, that *200 pounds* in 4b is not a syntactic, or ‘eventive’,

¹⁸ Weather predicates would seem to run counter to this idea, although that depends on whether one takes these elements to involve ‘quasi-arguments’ (of the sort that can enter control relations as in (i)):

- (i) Here it often rains without PRO pouring.

It is often the case, also, that weather predicates involve some periphrastic expression with nominal incorporation (i.e. in many languages ‘to rain’ is expressed as ‘to rain-fall’).

argument, but a mere lexical dependent, in that it does not participate in the eventuality of ‘weighing’ in any obvious sense (and see fn. 20).¹⁹ Eventive arguments, such as in *Bill* in 4b, function, in contrast, as canonical arguments; contrary to this, merely lexical dependents, such as *200 pounds* in 4b, function in some sense as adjuncts, as the examples in 5 show:

- 5a. [no island] What_i did Laurie weigh t_i ?
- 5b. wh-island: *What_i did Laurie wonder when she weighed t_i ?
- 5c. factive island: *What_i did Laurie regret the fact that you weigh t_i ?
- 5d. extraposition island: *What_i is it time to weigh t_i ?

Constructions in 5b-d are instances of extractions over weak islands. As Cinque (1991) shows, only arguments survive such extractions, not adjuncts. As in 5b-d, extraction of the measure phrase *200 pounds* is impossible. The obvious way of interpreting this is that *200 pounds* in 4b is some sort of adjunct of *weigh*, not an argument at all –even if a lexical dependency exists for this element.²⁰ Thus I assume

¹⁹ Recall: in my view only if an argument contributes to the computation of event complexity does it count as an event-participant, and thus a true argument.

²⁰ If this view is correct, we cannot simply liken ‘lexical dependency’ to ‘argument taking’. This is independently shown by instances, of the sort discussed by Grimshaw (1990), whereby an adverbial like *well* is taken to be crucial in somehow completing the lexical meaning of a predicate like *fare*, as in *may you fare *(well), my friend*. Of course this poses the serious question of what a ‘lexical dependent’ is in such instances, a matter that I have nothing to contribute to in this thesis.

that the sole syntactic argument in 4b is *Bill*, and from this point on disregard any further discussion of non-argumental lexical dependencies.²¹

The SAAC Hypothesis also directly dictates that a 2nd dimensional VP must have 2 arguments. I claim that the canonical predicates for a 2nd dimensional VP are transitive States with 2 arguments:

6a. Bill₂ loves Sherry₁

6b. Sam₂ knows Frank₁

6c. Mary₂ felt rain₁

Keep in mind that the subscripts in the underlined arguments are simply notating the dimension on the VP that these elements determine.

Similarly, the SAAC Hypothesis demands that a VP is 3rd dimensional if it has 3 arguments. Substantially, I assume that events denoted by Achievements (3rd dimension VP) involve ‘Change’ of states (Dowty 1979). I claim that the third

²¹ Extractions comparable to those in 5, of direct objects with transitive *weigh*, are significantly better than those with intransitive *weigh* in 5. In my terms, this is so since transitive (achievement) *weigh* is higher in order of complexity than the intransitive (state) *weigh* (and it has to be, given the SAAC hypothesis.) In other words, direct arguments with transitive *weigh* are bonafide arguments, in my sense. Witness:

- (i) Transitive *weigh*: Bill weighed his new chair
- 5b'. wh-island: ??What did Bill wonder when he weighed t ?
- 5c'. factive island: ??What did Bill regret the fact that you weighed t ?
- 5d'. exposition island: ??What is it time to weigh t ?

argument of such a VP is the spatio-temporal argument of Kratzer (1992a). Kratzer argues that predicates that denote events have an extra slot for a spatio-temporal argument, as opposed to predicates that denote states:

7a. Mary₂ reached the summit₁ in NJ₃

7b. Tom₂ noticed the smell₁ in his room₃

Achievements are felicitous with locative phrases, as in 7. In contrast, 2nd dimensional predicates, transitive States, are not usually felicitous with them (and see fn. 23):

8a. #Laurie₂ loved Ralph₁ in Boston

8b. #Kim₂ knew Korean₁ in Seoul

Also, extraction of the locative phrases over weak islands is impossible with intransitive States or measure predicates (1st dimensional VP), as illustrated in 9.

This contrasts with the well-formedness of a comparable extraction with the Achievement (3rd dimension) VP in 10:

9a. [no island] Where did Bill weigh 300 pounds?²²

9b. wh-island: *Where_i did they wonder whether Bill weighed 300 pounds t_i ?

²² I have argued above that states do not involve locative arguments; the locative here, thus, must be of an adjunctal sort –and see fn. 23 on this.

9c. factive island: *Where_i do you regret the fact that you weighed 300 pounds t_i?

10a. [no island]: Where_i did Bill notice an error t_i?

10b. wh-island: ??Where_i did they wonder whether Bill notice an error t_i?

10c. factive island: ??Where_i do you regret the fact that you noticed an error t_i?

I therefore assume that the co-occurrence of the predicates with locative phrases distinguishes states from more complex events: only in the latter instance are locative phrases real arguments.²³

For the 4th dimensional predicates, the SAAC Hypothesis requires 4 arguments. I claim that 4th dimensional predicates are Activities, such as:

²³ The following example is acceptable:

(i) They love Jerry Lewis in France

However, the locative phrase ‘in France’ here is a topical, or contextual phrase, yielding something to the effect of ‘in (the context of) France, they love Jerry Lewis’. In languages such as Japanese, this is clearly manifested in that the locative phrase bears topic or genitive Case, as in (ii) and (iii), respectively:

(ii) Fulansu-de^{7*} (-wa) hitobito-wa suisu-go-o sit-te-iru
France-in(-top) peope-top Swedish-acc know-comp-be
(People in France know Swedish)

(iii) Fulansu-no hitobito-wa suisu-go-o sit-te-iru
France-gen people-top Swedish-acc know-comp-be
(People in France know Swedish)

Moreover, extraction of the locative phrase over weak islands in this construction does not pattern with that of arguments (cf: 10):

(iv) *Where_i do you wonder whether they love Jerry Lewis t_i ?

(v) *Where_i do you regret the fact that people love Jerry Lewis t_i ?

11a. Peter₄ shaved at home

11b. Peter₄ stabbed Zachary in the hall

Needless to say, these do not obviously have the required 4 arguments. However, consider the periphrastic versions of the verbs in 12:

12a. Peter₄ gave himself₂ a shave₁ at home₃

12b. Peter_{4th} gave Zachary_{2nd} a stab_{1st} in the hall_{3rd} arguments

Based on these data, I claim that the sentences in 11a and 11b involve incorporation of the 1st dimensional Presentation, *shave*, and *stab* to an abstract light verb akin to *give* in (12a) and (12b) (cf. Hale & Keyser 1993). In sharp contrast to this, Achievements, which again I take to correspond to a 3rd dimensional VP, cannot have periphrastic versions analogous to those in 12:

13a. Mary won the race in the stadium

13b. *Mary₄ gave herself₂ a winning/victory of the race₁ in the stadium₃

13c. *Mary₄ took herself₂ a winning/victory of the race₁ in the stadium₃

Indirectly, this suggests that Activities in 11 have more complex argumental structure than Achievements (the 3rd dimension) in 13, as the SAAC leads us to expect. As it turns out, I will end up making a big deal of these ‘light-verb’ paraphrases: in fact I

will suggest that they always underlie complex argumental dependencies (within the highest dimensions).

By now, it should be obvious that the SAAC Hypothesis expects 5 arguments for a 5th dimensional VP. I claim that Accomplishments are indeed the 5th dimensional VPs:

14a. Helen built the house in Uchita

14b. Helen painted a picture in the classroom

Notice that, as we saw for Activities in 12, 14a and 14b can be periphrastically expressed as in 15a and 15b, respectively:

15a. Helen built herself/someone the house in Uchita

15b. Helen painted herself/someone a picture in the classroom

But even when invoking this periphrasis in 15 we are one argument short. Hence, I claim that there is an implicit Agent argument in 15. This is not implausible if *Helen* is both Causer and Agent of *build* in 15a, as in the somewhat pedantic, but fully accurate periphrastic expression in 16, involving the light verb *have*:

16. Helen_{5th} had herself_{4th} build herself_{2nd} the house_{1st} in Uchita_{3rd} arguments

Curiously, analogous periphrases are possible neither for Activities (the 4th dimension) nor for Achievements (the 3rd dimension):

17a. Mary reached the summit in NJ ≠

*Mary₅ had herself₄ reach herself₂ the summit₁ in NJ₃

[The 3rd dimension: Achievement]

17b. Peter stabbed Kim in the yard ≠

*Peter₅ had himself₄ stab himself₂ Kim₁ in the yard₃

[The 4th dimension: Activity]

Examples 15-17 suggest that Accomplishments are significantly more complex than either Achievements (the 3rd dimension) or Activities (the 4th dimension).

Notice that the way I have generated Activities and Accomplishments involves light verbs akin to *give* or *have*, without which the SAAC Hypothesis would immediately fail. In my view this is quite significant, suggesting a basically bi-clausal analysis for the two most complex predicates in our analysis, while the simpler predicates remain mono-clausal. Another way of saying this is that Activities and Accomplishments correspond to syntactic spaces of a more complex sort than the simpler predicates. I return to this matter occasionally throughout this thesis, with special attention to it in section 2.4 of this chapter, chapter 6, and chapter 7.

I should emphasize to conclude this section that the obtained order of verbs, the series Accomplishment > Activity > Achievement > transitive State > intransitive State is, of course, hardly surprising from a traditional, descriptive perspective.

2. 3 Agents and Causers –Arguing for Syntactic Distinctions.

I realize that the subtle distinction introduced above, between the top two layers of dimensional complexity, may be seen as controversial. In this section I provide an argument that it is real, in the process showing the sort of defense I will be mounting of the present theory. Since in my approach the 4th order of complexity involves Agent, but not Causer, whereas the 5th order of complexity involves both Agent and Causer (i.e. the 4D lexical verbs are dimensionally, hence structurally, less complex than the 5D ones), considerations of VP ellipsis ought to allow us to argue for or against this conclusion.²⁴

Take, to start with, sentence 18 –for the scenario below. The relevant verb here ought to be involving the 4th order of complexity (assuming that, just as in the English counterpart, *cry* is an Activity verb in Japanese):

²⁴ I discuss VP ellipsis in chapter 5 in much more detail.

18. Masaru-ga oo-goe-de nai-ta.
 -nom big-voice-at cry-Inch-past

(Masaru cried loudly.)

[Scenario: Hiroshi is a movie director. Masaru and Shigeru are actors. Hiroshi tries to persuade both of them to cry as loud as they can in one of the scenes for the movie. They both are reluctant to do it. However, Hiroshi succeeds in getting Masaru to cry out loud in the movie.]

Now observe the crucial data:

19. Hiroshi-ga Masaru-o oo-goe-de nak-asi-ta-node,
 -nom -acc big-voice-at cry-Caus.-past-because
Shigeru-mo sibusibu soo si-ta
 -aslo reluctantly so do-past

(Lit.: Because Hiroshi cried Masaru loudly, Shigeru reluctantly did so, too. [Because Hiroshi made Masaru cry loudly, Shigeru reluctantly cried loudly, too.])

In 19, the verb stem *nak* (cry) has the lexical causative morpheme *asi* attached to it.²⁵ As a consequence, Hiroshi is taken to be a Causer, who causes the Agent Masaru's crying. I suggest this alone is already a strong piece of evidence that the lexical 4D exists, involving an Agent and (in itself) without a Causer, precisely because a bona-fide 4D verb can be *lexically* causativized. In addition to this lexical causativization, however, the pro-form *soo-sita* (did so) can replace the 4th dimensional lexical VP, *cry* in 19.

As I show in chapter 5 in detail, VP ellipsis by *soo-suru* (do so) in Japanese involves standard syntactic operations, targeting the constituent elements to be elided. If so, the 4D VP in 19 is plainly an accessible structure, and one in which the causer is clearly factored out. That is, the 4th order of dimensionality manages to exist as a constituent within the 5th order of dimensionality –so the 4th VP is syntactically real. In contrast, the 5D VP clearly involves both Agent and Causer roles, according to the interpretation in 19. Since Causer is the crucial difference between the relevant VPs, it must be the case that the Presentation for the 5th VP is precisely the Causer.²⁶

²⁵ Note that *asi* is one of Jacobsen (1992)'s nine lexical verbal morphemes in Japanese. See also Shibatani (1976), who in effect also endorses *asi* in 19 to be a lexical verbal morpheme, based on reflexives, etc. This morpheme is not to be confused with external causativizer (*s*)*ase*. This morpheme can attach to an already lexically causativized verb to denote further causativization, demoting the lexical Causer into an inner Causer, and adding an external Causer through increasing valance by one. See footnote 91 and chapter 6 on this.

²⁶ For additional support to this contention, see chapter 6, where, again the 4D is shown to be a sub-constituent of the 5D in verbal dimensional structures.

2. 4. The Underlying Intuition.

I would now like to clarify what is novel in my proposal vis-à-vis Uriagereka's in (1995, 2002: chapter 5). The Dimensional Theory is just a framework to organize lexical structure, along the lines sketched in the preceding pages, which is testable in roughly the ways I indicated in the previous section. Although Uriagereka made explicit reference to the Vendlerian organization of sub-events, he actually never spelled-out things in as much detail as I have, or in the particular ordering I suggest (e.g. he placed activities below achievements). My particular hierarchical organization is a result of my own empirical investigation, and I consider it both novel and falsifiable in standard ways. But it should be said that both Uriagereka and myself still need to explicate why it is that the organization is the way it is, or more precisely *how* the topological complexities that the purely formal syntax provides trivially map to corresponding semantic nuances.

It would take me too far afield (and require more mathematical knowledge than I have) to answer that question fully, but I do want to emphasize one point already raised above: the mapping, in my view, has to be somewhat *trivial* if it is to be understood in standard minimalist terms. It shouldn't 'waste formal resources' or use 'coding tricks'. Intuitively, the various warps in the system produce more and more entangled formal structure, starting with very simple spaces and adding dimensions of complexity to them. But while this is relatively easy to visualize for low-dimensional spaces, it becomes more difficult for high-dimensional spaces (anything beyond three

dimensions). That said, I can only speculate on why things map the way they do, simply hoping that the mapping remains trivial, or at least ‘natural’ in some sense.

One thing is certain, the sequence Accomplishment > Activity > Achievement > transitive State > intransitive State intuitively decreases in formal complexity (as one goes from left to right). The most basic notion in the series is simply used to merely *present* an entity in a certain mode; the second notion already *relates* two entities. Then in the middle of the hierarchy, with characteristic *boundedness*, a spatio-temporarily-located (bounded) space appears; the top part of the hierarchy starts, in essence, with iteration of these bounded sub-events, creating a new kind of higher order space –I call this a ‘hyper-space’²⁷; boundedness in that ‘hyper-space’ appears again at the top of the hierarchy, perhaps via an emergent super-structure (see Saddy and Uriagereka (2004), Uriagereka (forthcoming)). In other words, the 2nd dimensional space expands the Base dimension to create an open space to be bounded at the 3rd dimensional space. This bounded ‘object’ at the 3rd dimensional space iterates, expanding the space at the 4th dimensional space. The 5th dimension again bounds this new, open, hyper-space. In this ‘swinging’ architecture of spaces,²⁸ the 3D objects are the units of the 4th and 5th dimensional spaces, in that the latter two dimensions operate on the 3rd dimensional object: the 4th dimensional space iterates this 3D object into the hyper-space, and the 5th one bounds that space-creating iteration. Thus this approach expects a natural ‘cut’ at the 3rd dimensional space,

²⁷ I owe this expression to J. Uriagereka (p.c.).

²⁸ I come back to this point in more detail in chapters 6 and 7.

translated in lexical verb structures, if I am correct, as ‘bi-clausality’. I will elaborate more on this point immediately below.

In this thesis I am just a consumer of the particular take on cognition that the Dimensional Theory assumes, and my contribution to this aspect of the theory can be seen as merely (though importantly) empirical. For example, I believe that my particular organization of sub-events (as opposed to the one Uriagereka suggested in 2002: chapter 15) fits more directly to his desideratum of having a trivial mapping between the formal syntax and a corresponding denotation. This is particularly so because I essentially divide the mapping task in two domains as above, which we may think of as a ‘mere’ space and a kind of, as I already said, a ‘hyper’ space. The lower-dimensional denotations, for me, stop at the Achievements, which corresponds to a very simple bounded space. I take this bounding to be implicated in spatio-temporal contextualization, in the intuitive sense of human perception: it is arguably impossible to contextualize an open, boundless space.

But where things get interesting is when the system apparently allows humans to conceive, in essence, of organized sets of the denotatum for Achievements as higher-order hyper-spaces. The intuition behind this idea is actually well-known. For instance, McClure (1995) argues that Activities are ‘made up of’ a series of Achievements. The activity of walking, for example, consists of smaller stepping achievements, the Goal of the steps being controlled by the Agent.²⁹ Moreover, we

may more or less pedantically express in the progressive that *John is stepping* to indicate (an activity compatible with) his walking. On that model, it appears that lexically expressed activities, like *John walked*, are something like ‘progressively organized’ sub-events (e.g. in the case of walking, of step-taking). This goes very well with the suggestion, made in section 2.2.2 that activity expressions involve some light verbal expression that in effect induces a bi-clausal analysis: the hyper-space we are now describing correlates with the bi-clausal analysis, and would not be expected of simplex expressions.

At that point, it becomes natural to ask what happens next. In the studies of complex systems cited above, some emergent object appears as a ‘result’ of continuous input of energy, i.e., symmetry-breaking as a result of sufficient looping. I suggest, without argument, that this is what is coded at the 5th order of dimensional complexity, bounded space (viz. resultant state) marking the end of a flow of energy (viz. causative event).

All of that, with the specifications that my particular take on the Vendler hierarchy adds, I assume from the Dimensional Theory, and I have relatively little to add. (Although, again, I claim novelty in my substantive organization, which is behind my distinction between mere spaces and hyper-spaces, and the corresponding simplex vs. bi-clausal syntax.) The main focus of this work, however, comes from a further assumption: that the particular presentations, in the specific technical sense of the

²⁹ I thank Juan Carlos Castillo for bringing this insight to my attention.

topological Induction, which warp the VP are actually what we normally think of as theta-role relations. That is, the SAAC Hypothesis.

2.5. Aktionsart and the Thematic Hierarchy.

In this subsection, I attempt to deduce the Thematic Hierarchy in Jackendoff (1972) and the property of predicates pertaining to internal arguments from the structure of the VP that I assume. The Thematic Hierarchy falls out of the verbal syntactic structure proposed here, and furthermore the topological induction of the C_{hl} guarantees that a 'Theme' is special in that it is a must for any verbal projection, which thus grounds the entire thematic hierarchy, in important ways that I come back to.

2.5.1. A Substantive Structure of the Lexical Verbs.

Each dimension of the VP, its underlying lexical structure, and what I take to be its corresponding Presentations are summarized below:

20.	<u>dimensions:</u>	<u>Presentations:</u>	<u>underlying lexical structure & example:</u>
	5 th dimension: Causer		↔ Accomplishment [<i>build, eat</i>]
warp	4 th dimension: Agent		↔ Activity [<i>stab, run</i>]
warp	3 rd dimension: Spatio-temporal		↔ Achievement [<i>win, notice</i>]
warp	2 nd dimension: Experiencer/Goal/ Benefactive		↔ Transitive state [<i>love, know</i>]
warp	1 st dimension: Theme		↔ Intransitive state [<i>exist, weigh</i>]

For example, the followings are the structures of the 3rd, 4th, and 5th dimensional VPs.³⁰

21.	<u>3rd dimension VP:</u> <i>Mary noticed an error in the lab.</i>	<u>4th dimension VP:</u> <i>Peter stabbed Kim in the hall.</i>	<u>5th dimension VP:</u> <i>Helen built herself a house in Uchita.</i>
5d: Causer:			sc / \
4d: Agent:	sc	sc Peter	sc Helen _i
3d: Locative:	/ \ sc in the lab	/ \ sc in the hall	/ \ sc <i>implicit</i> argument _i
2d: Goal:	/ \ sc Mary	/ \ sc Kim [Goal]	/ \ sc herself
[Experiencer]	/ \	/ \	/ \ [Benefactive]
1d: Theme:	win the race	<u>v</u> stab	build a house

Note that I take Presentations for the 2nd dimension to be different in each instance:

Experiencer, Goal, and Benefactive, for the 3rd, 4th, and 5th dimension VPs,

³⁰ I can represent Agent as an ‘implicit argument’, indicating its referential identity with the Causer through co-indexation. I assume this without argument, leaving the details behind the implied context-sensitive relation for future research.

respectively. Therefore, I am forced into the claim that Experiencer, Goal, and Benefactive are *one type* of thematic role, and use ‘Goal’ as a mere cover term for these variants.

2. 5. 2. Towards A Possible Justification of the Mapping.

Before going any further, I must face the same sort of question now, with regards to the denotatum-denotation relations, that I discussed in section 2.4 for the Dimensional Theory at large: Why, say, is what we can think of as a Goal the presentation *for the 2nd dimension VP*, and not the 3rd, while the 3rd dimension requires a locative. I only have a partial, tentative answer to this question, based, I admit, on the fact that I am *trying* to reduce an Aktionsart hierarchy to a thematic hierarchy, each of which can be established independently.

That what we call Theme should be the first, and hence defining, Theta-role needs little empirical justification: this expresses, in effect, Tenny’s (1987) intuition that the Theme ‘measures out’ or delimits the denoted event. More generally, one can think of a verb as *a dynamic function over the Theme space*. That is, verbal expressions will be about their Theme, and their whole purpose is to monitor, as it were, the dynamical fate of the entity denoted by the Theme in a changing universe. In a sense, a given theme determines a class of verbs, presumably as a result, at least in part, of the dimensionality of the theme itself qua nominal space (roughly in the sense of Muromatsu (1998)). Once the theme sets up the verbal space(s), the rest of the

arguments, if they exist, are taken to determine further qualifications on this space (or spaces).

Next comes the Goal. As I discussed in the previous section, verbal denotations at this level of complexity introduce (binary) relations. That is the key: events with only mere themes to them (in unaccusative expressions of the stative sort) simply denote whichever space the theme denotes, presented in the certain dynamic fashion that verbs allow because of Tense specifications. But this is, still, very static dynamicity, because it has virtually no complexity to it. This is the reason why unaccusative stative verbs typically denote mere existential or presentational notions: all one can do with them is assume the presence or existence of whatever the theme happens to denote in itself, and place that in relation to some speaker time, period. However, the moment a further argument is introduced, a Goal, then a (Theme, Goal) relation becomes immediately possible, and with it further nuances that go beyond the Theme specifications, and which essentially center it with regards to the specifications of the Goal.³¹

Why is the Location next? As I suggested in the previous section, the third-dimensional VP is bounded *because* the warping of the two-dimensional, relational, VP creates this particular limitation on the space, upon coiling it onto itself (much as the doughnut I referred to in section 1.4 emerges from folding a lower-dimensional

³¹ This, of course, doesn't tell us why a Goal comes out as an Experiencer when the verb its denotation contributes to is low-dimensional and as a Benefactive when it is high-dimensional. This is a very interesting nuance that I must leave for future research.

open-ended space). Then it is natural to expect that the presentation at this level should be concerned with this form of telicity. In order to coil a cigar band into a doughnut, we need crucially to identify the edges of the former (so that they serve as coiling points). And thus it may not be surprising that the corresponding denotation for this is taken to be precisely of the ‘coordinate sort’, which in cognitive terms for humans translates as spatio-temporal notions.

I confess that things get more murky for the two highest VPs. True, if what I said in the previous section is right, here we are dealing, essentially, with hyper-spaces of a very dynamic sort –related to the basic bi-clausality of the underlying expressions. But why should, specifically, Agents and Causers, and in that particular order, be involved in their denotations? In short, I don’t know, but I do want to offer a speculation that the system I am assuming forces me into.

Again, at this level of complexity we would be formally dealing with a presentation that forces the space into a higher system that operates on previously obtained coiled space to create what translates as achievement iteration; and furthermore, in the highest level, with a presentation that forces the appearance of an emergent bounded construct as a result, which translates as an accomplishment with some end-result. I suggest that we conceive Agents as ‘energy without emergence’, in that the implied dynamic system representing the relevant notions does not reach the relevant critical threshold for obtaining emergent properties via symmetry-breaking. In any case, the crucial point for me is that Agent is a prerequisite for the

notion of Causer in the structure that I propose, but not the other way around.³² In a sense, the 5th order of verbal dimensional complexity constitutes a boundary in the hyper-space defined at the 4th dimension. If this information is mapped to semantics as the boundary of an event, obviously the least amount of information is lost. So just as the 3rd order of verbal dimensional complexity maps to a bounded spatio-temporal space, so too does the 5th order of dimensional complexity map to a bounded stable space (equilibrium in the dynamic terms alluded to).

That accords well with human intuitions about Agents and Causers. Jack's *actions* (which make him an agent) may not *cause* the desired end-results. Thus we can say that Jack set a book on fire in a pile of fallen leaves, but he actually did not manage to cause the book to burn; yet it makes no sense to say that Jack managed to burn a book, but he didn't *do* anything. He may not have done it directly, but if he doesn't *initiate* a chain of events, no matter how remote, the causation will surely not obtain. Causation entails agentivity (in some sub-event), but not vice-versa. This, at the very least, corresponds well to the fact that an emergent property obtains as a result of continuous input of force –as in the studies of complex systems alluded to in fn. 32– but not vice-versa.

The following chart is meant as indicative of the system just described:

³² Thus this is already a specific kind of causer in need of justification, as P. Pietroski notes through personal communication. The intuitions raised in the text about complex systems are taken essentially from Meinzer (1994).

Chart 1: Complex Dimensional Organization of the VP:

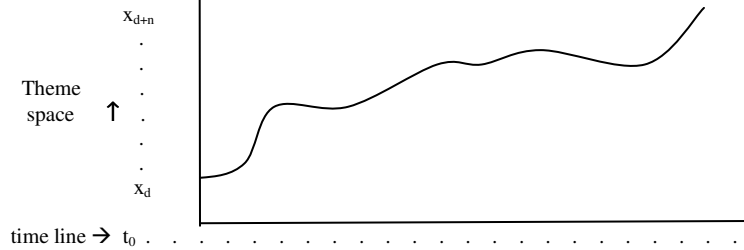
(i) VERBAL THEME: NOMINAL SPACES OF VARIOUS DIMENSIONALITIES

(as in Muromatsu (1998))



THEME SERVES AS BASE FOR 1ST DIMENSIONAL VERBAL SPACE

(ii) EVENTUALITY BASED ON THEME: DYNAMICAL FUNCTION ON THEME SPACE



The theme space can be conceived as pertaining to a degree of some sort that is monitored through time, increasing, decreasing, changing or remaining constant depending on internal specifications

(iii) ACTIONSART: EVENT SPECIFICATIONS CORRESPONDING TO FORMAL COMPLEXITY. SYNTAX:

	Verbal dimensions:		Resulting formal space:
<i>BI-CLAUSAL</i>	warp 5 th dimension	↔	hyper-space into emergent space
	warp 4 th dimension	↔	hyper-space based on coiled spaces
<i>MONO-CLAUSAL</i>	warp 3 rd dimension	↔	bounded space/coiled space determined by warping space into coil
	warp 2 nd dimension	↔	open space created by binary relations projected from Theme
	warp 1 st dimension	↔	trivial space with static characteristics of Theme

(iv) ACTIONSART: EVENT SPECIFICATIONS CORRESPONDING TO FORMAL COMPLEXITY. SEMANTICS:

Presentations (Theta roles):		Event denotation:
5 th D inducing Causer	↔	culminating Accomplishment
4 th D inducing Agent	↔	open-ended Activity
3 rd D inducing Location	↔	telic Achievement
2 nd D inducing Goal	↔	path-oriented Relational State
1 st D inducing Theme	↔	Existential/ Presentational State

2. 5. 3. A Clarification on Event Delimitation.

A final clarification is in order before deducing the Thematic Hierarchy. I have assigned the role of event-measuring to Themes, as in many important preceding pieces of research (Tenny 1987, 1994, Kratzer 1992b, among others). However, there are constructions that are claimed in the literature to measure out or delimit events by way of elements other than Themes:³³

22. Robert threw Betty a ball.

23. Robert loaded the wagon with hay.

In these instances it may look as if it is Betty that helps us keep track of the development of an event, as in (22), and likewise in (23) it seems to be the wagon that is determining the measure of the relevant event. Thus one might argue that it is the accusative-marked element, rather than the Theme as such, that is closely associated to the measurement of an event. In what follows, I suggest otherwise, and offer a mechanism that derives the sorts of examples in 22, and possibly also 23.

For 22 I would like to suggest that it is both the Theme *a ball* and the Goal *Betty* that *together* measure the event. That is to say, it is really the *path of motion* that *a ball* creates, in conjunction with the Goal *Betty* delimiting the relevant end-point of

³³ I thank N. Hornstein for bringing this point to my attention.

that path, that helps us keep track of the event described by the verb in 22. It is only a mirage to think that Betty does the delimiting, and if we think of the matter without preconceptions, it becomes obvious that Betty, as such, has nothing to do with the measuring: it doesn't matter whether Betty is tall or short, thin or fat, etc. What does matter for the relevant event measure (i.e. duration) is how far Betty is from wherever the ball starts its motion –but this is a consideration about a path, not a person.

In a sense, the constituent denoting this subevent, [_{3rd VP} *Betty a ball*], in 22 is an 'extended Theme'.³⁴ This actually receives a natural account in the structure that I propose. In chapters 5-7, concretely, I argue that the 3rd VP is the new Theme to the higher predicate. As in chapter 7, section 7.1, this is derived solely from structural complexity and properties of the C_{hl}. Chapters 5 and 6, in turn, show that the 3rd VP is a bona-fide constituent within a lexical structure. As such, I expect the 3rd VP to be a 'cut', which maps into semantic notions with some additional effects.

As for example 23, I can also offer the same line of reasoning: the complex constituent [_{3rd VP} *wagon with hay*] serves as an extended Theme, measuring out the relevant event. This is so to the extent that *wagon* and *hay* together can be treated as the 3rd VP constituent in 23. That is, I claim that the 3rd VP constituent is made use of both in 22 and 23, structurally singled out as a new Theme for the higher 4th and 5th orders of dimensionality, due to the bi-clausal nature of lexical verbal structures

³⁴ This is in roughly the sense that Pietroski and Uriagereka (2002) give to the thematic notion 'Terminator', in essence a kind of theme for light verbal expressions (see Uriagereka forthcoming: chapter 2 for clarification of this point).

involving light verbs (and see fn. 35). As such, I suggest that ‘extended Themes’ play a crucial role in examples 22 and 23 as well.³⁵

2. 6. Conclusion: Deducing the Thematic Hierarchy.

Further justifications and clarifications aside, as is evident from the structure in the preceding chart, the proposed structure of the VP yields the following thematic hierarchy:

24. The thematic hierarchy (e.g. in 19 above):

Causer > Agent > Location > Goal, (Experiencer, Benefactive) > Theme

This certainly deduces, and even refines further, the Thematic Hierarchy, in particular in Jackendoff’s (1972) version:

³⁵ The *Load* alteration is more complicated than *throw* one, and I will leave it for future research. Equally unexplored here is the well-known contention that a lexical verb *in conjunction with* its direct object determines Aktionsarten (see Schmitt (1996) for this and much related useful discussion):

- | | |
|----------------------------|----------|
| (i) Bill ate cakes. | [atelic] |
| (ii) Bill ate three cakes. | [telic] |

I limit the scope of my dissertation here within ‘core cases’, the ones not involving bona-fide quantifiers, specificity, and the like. Hopefully, getting the core cases right will pave the way to deal with these more complicated issues.

25 The Thematic Hierarchy:

Agent > Goal, Location, Source > Theme

(Jackendoff 1972: 43)

In sum, in this chapter, I presented a syntactic structure of lexical verbs. Following the Dimensional Theory, the complexity of the structure is directly reflected on the complexity of event structure it denotes. Specifically, I proposed a five-layered verbal structure with five syntactic arguments as Presentations. And based on that structure, I obtained one version of the Thematic Hierarchy, a novel result. I take this to be a good argument for the view of things I advocate, especially because other researchers need to both justify the role of the Thematic Hierarchy in the model (what is its nature), and moreover articulate correspondence rules between it and its manifestation in syntactic relations. It is not enough to postulate a hierarchy for the theory to work: we must also be told how (and of course why) the correspondence maps into the syntax the way it does. All of this is achieved in my terms, as the syntax in effect *is* the hierarchy.

The way I have organized things, the dimensions of verbal complexity emerge as a result of argument taking, and only thus. This is the SAAC Hypothesis. Granted, to make it work I have had to make a couple of abstract claims, like positing incorporated arguments for complex dimensions, distinguishing not-obviously-distinct Agent and Causer roles (which end up being co-referential), interpreting what might have looked like Locative adjuncts as arguments of a certain sort, lumping together into a Goal class a variety of a priori distinct roles, or reorganizing the

traditional sequence of sub-events in the Aktionsart hierarchy in a novel way, with Activities higher than Achievements. But I don't think these are merely fanciful moves.

In getting creative in this part of the theory, first of all I submit that I have also found new and interesting regularities that would have otherwise remained hidden. In particular, the way I have presented things the Dimensional Theory makes more sense for the VP, inasmuch as it has a mono-clausal and a bi-clausal cut to it, in the latter instance involving light auxiliaries. I return to this important distinction in Chapter 6, where it can be seen to correlate with two major classes of verbal suffixes (causative and inchoative) in Japanese. Within each of these cuts, space is organized in terms of a class of relations of a more or less complex sort, and a furthermore a logical culmination to it (correlating with so-called 'telicity'), a matter that will be important, also, in Chapter 6. Second, I think that cleaning up and strengthening the Dimensional Theory in this particular way is sound in itself, for as far as I can tell there are no worked out minimalist alternatives to it. Ignoring Thematic and Aktionsart hierarchies is not descriptively adequate; but having them stipulated as accompanying theoretical ghosts fails on explanatory grounds, particularly in a system with the stringent tenets of the Minimalist Program. In contrast, what I have presented above is a fairly straightforward model that meets minimalist desiderata, one furthermore that can be easily tested.

Chapter 3: Direct Arguments for Dimensional Structuring within VP.

In this chapter I would like to present five pieces of direct linguistic evidence in support of the verbal structure laid out in the previous chapter. To understand the overall nature of this evidence, readers are reminded that my hierarchy emerges because of the dimensional organization of syntax that I am assuming from Uriagereka's work. The relevant implicational architecture is much more tightly constructed than a mere sequence –which would suffice to formally construct a hierarchy of the sort researchers assume for relevant purposes. My evidence will focus on this, attempting to demonstrate that an inductive base exists for the architecture, first of all. Next I try to show that the elements that make up the hierarchy are not simply listed, but rather when they do contribute to the hierarchical architecture, they constitute a separate species of syntactic dependent (basically, an argument), with very specific properties associated to them. Moreover, I will try to show how the 'onion layer' structure of the dimensions is real in that selectional restrictions can be stated over internal layers from the syntactic confines of the outside layer, though of course not vice-versa.³⁶

First, I argue that the requirement of an *existential import for implicit direct objects* with certain types of verbs in English receives a natural account in the present

³⁶ Importantly, the verbal type of expressions does not change as dimensions 'grow', unlike what happens in instances involving, say, a change from VP to TP, or from TP to CP. I do not deal with these at all here, but see Uriagereka (1996) for a speculation on those 'cuts'. In any case, since VPs of various dimensions are still VPs, selection can be stated at any relevant layer –so long as this layer exists. (For instance, if a category is such that it selects an n - m^{th} dimensional VP, it will also be able to select an n^{th} dimensional VP, but not vice-versa.)

system (Section 3.1). Then I present data which suggest that the control of an empty element in the subject position of certain purpose clauses is sensitive to the type of predicates *and the type of syntactic arguments* a predicate can have (Section 3.2). Thirdly, I demonstrate that the ‘lone-quantifier test’ (T. Baldwin, p.c.) singles out the proposed syntactic arguments, *in accordance with the complexities of events* denoted by the verbs for various dimensional orders of syntactic structures (Section 3.3). I also discuss selectional properties of aspectual verbs, which crucially refer *to the complexities of events their VP complements may denote*, showing that the ‘dimensions’ are both theoretically significant and empirically real (Section 3.4). In addition I present adjunct/argument contrasts to show that, in particular potentially controversial dependents of verbs that may seem at first sight like adjuncts instead of arguments, turn out to behave as arguments in precisely the syntactic contexts where my approach predicts this (Section 3.5).

3. 1. Existential Import of Themes.

In this section, I claim that the, otherwise mysterious, requirement of an existential import for implicit direct objects involving Accomplishments (the 5th dimensional VP) in English follows naturally from the structure of the VP proposed here.

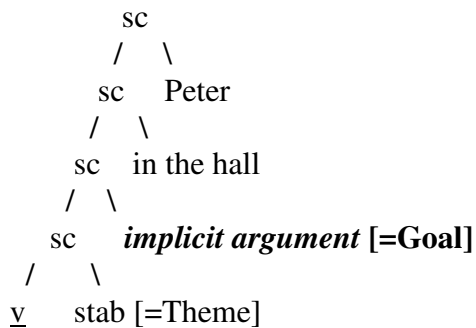
Parsons (1990) notes that a verb like *eat* requires existential quantification over (or more generally, existential import for) the implicit direct object, whereas a verb like *stab* does not:

1. In a dream last night,
 a. I stabbed. But I stabbed nothing.
 b. I ate. ?*But I ate nothing.

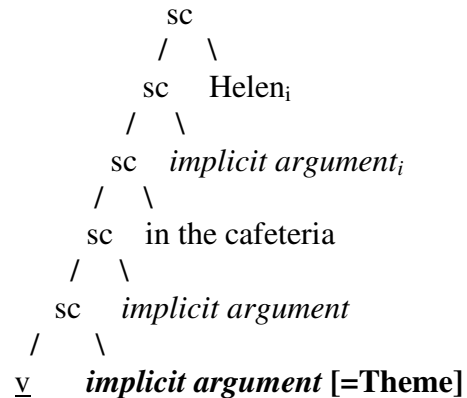
(Parsons 1991: 97-98. Also, Schein 1993: 93-94)

These properties of *eat* and *stab* can be shown to follow from the structural position of Theme and Goal in 1, given the assumption, already discussed in section 2.1, that *Theme is a defining characteristic* of a verb phrase. Note, crucially, that the apparent ‘direct object’ of *stab* (Activity, the 4th dimension) is in my analysis a Goal, whereas that of *eat* (Accomplishment, the 5th dimension) is an implicit Theme,³⁷ as in 2 (relevant arguments are boldfaced):³⁸

2a. 4th dimension
 Peter stabbed in the hall.



2b. 5th dimension
 Helen ate in the cafeteria.

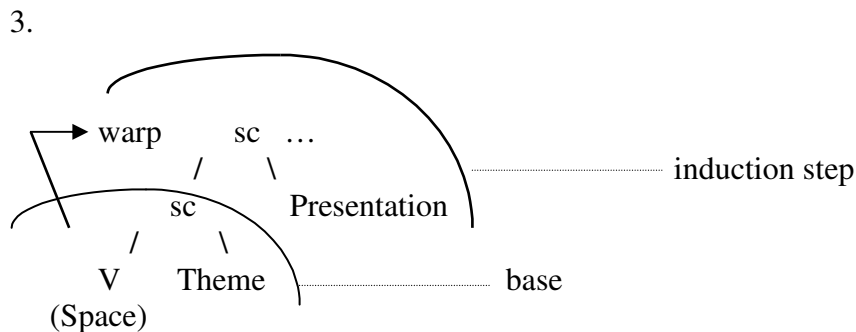


³⁷ Note, for example, that the direct object of *eat* measures out an eating event, while the direct object of *stab* does not. (While an eating cannot last longer than the extent to which the contents of a certain dish remain, how long a stabbing lasts has nothing to do with the size, length, age, or any other direct measuring quality of the stabbed.) This is a characteristic of Themes, not Goals.

³⁸ I treat the Presentations which are not assigned a full NP in syntax as ‘implicit arguments’. See fn. 30.

The tree diagram in 2a represents the structure of the 4th dimensional VP for the verb *stab*, whereas 2b is that of the 5th dimensional VP for the verb *eat*. As in 2b, the implicit argument of *eat* is the Presentation for the 1st dimension VP, Theme. In contrast, the implicit argument of *stab* in 2a is the Presentation for the 2nd dimension VP, Goal -the incorporated noun *stab* being the Theme.

Again, recall the assumption (in section 2.1) that Theme is the defining characteristic of the verb. To repeat, without the Presentation for the 1st dimensional VP, Theme, we do not even obtain an object which we can call ‘a verb’ –quite simply, without the base, there are no induction steps to be taken:



The existential import for the implicit argument of *eat* is the direct reflex of this basic idea. The crucial difference between 2a and 2b is due to the position of the implicit argument. In 2b, the implicit argument is the 1st dimensional Presentation, Theme. In

order to obtain the base for the verb, the Theme must exist.³⁹ In contrast, the implicit argument of *stab* is not Theme, but Goal, as in 2a. Since Goal is not a defining requisite of a VP, the existential import of the implicit Goal argument is not invoked.

Note, incidentally, that the idea just discussed sharply separates conceptual from intentional demands. A given dimension imposes a conceptual requirement, but existential import for a corresponding denotation is an intentional condition. The presupposed existentiality for the Theme argument is architectural: in effect, inasmuch as the entire verbal space is constructed around the Theme.

Needless to say, the analysis just offered predicts that *any* implicit argument of a VP requires an existential import if it is the Presentation for the 1st dimension VP (and only then). For example, the implicit ‘direct object’ in ‘Sam knows’ is the Presentation for the 1st dimensional VP as in 29a, and, thus, it should have an existential import –which appears to be true, as 29b shows:

³⁹ Of course, (i) is possible:

(i) My child eats absolutely nothing.

This poses a familiar problem with negative quantifiers in existential conditions, for instance as in (ii):

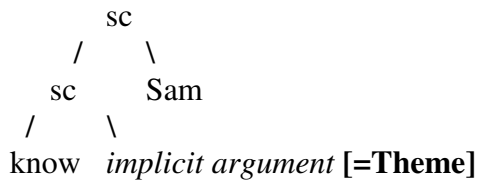
(ii) There is nobody here.

In both instances, the obvious solution is to decompose the negative quantifier into a negative marker and an existential so that (i) gets a reading as in (iii) and (ii) as in (iv):

(iii) It is not the case that my child eats something.

(iv) It is not the case that there is someone here.

4a. Sam knows: (2nd dimension: transitive State):



4b Sam knows. *?But he knows nothing.

Importantly for my purposes, Kratzer (1992b) explicitly proposes that Theme is special in not requiring of the argument carrying this role that it should be an ‘event participant’ in some direct way, unlike other arguments with other roles.⁴⁰ Likewise, as already mentioned in chapter 2, Tenny (1987) gives a special status to Theme, as an event ‘measurer’ and (possible) ‘delimiter’. This two-way distinction between Theme and other arguments corresponds directly to categorial base and induction steps in my terms, an idea that fits well also with the special treatment (in terms of ‘terminating’ conditions) that Pietroski and Uriagereka (2002) give to the Thematic base. Of course, in these works, the special status of Themes is merely stipulated. In contrast, given the architecture I am assuming here, that the Thematic Hierarchy should start in themes directly follows.

⁴⁰ Uriagereka (forthcoming) distinguishes between mere participating roles and *articulating* roles, the latter being either Themes (for the first argument of a lexical verb) or what Pietroski and Uriagereka (2002) call Terminators (basically, Themes for light verbs). Articulating arguments enter into constructing the lexical foundation of an event, unlike other arguments, which simply add further qualifications.

3. 2. Control in Purpose Clauses.

Control into purpose clauses offers us yet another type of evidence for the varying degrees of syntactic complexities of lexical verbs –and thereby the differing orders of dimensional complexities for events denoted by verbs. Moreover, we will see that it is not enough for the controller to be an argument *of a certain semantic type*. Rather, it has to appear in a given hierarchical position, which in my terms is one of those that determines a dimensional cut.

Chierchia (1989) notes that Benefactives are capable of controlling the empty element in the subject position of purpose clauses (5).⁴¹ I refer to this empty element as an ‘implicit argument *e*’. Given 5 as a discourse, the Benefactive *the children* is able to control the implicit argument *e* of the purpose clause, even in the passive construction in (6):

5. Mary built that board [_{Beneficiary} for the children] *e* to play with

e = ‘the children’

(Chierchia 1989: 156 [12a])

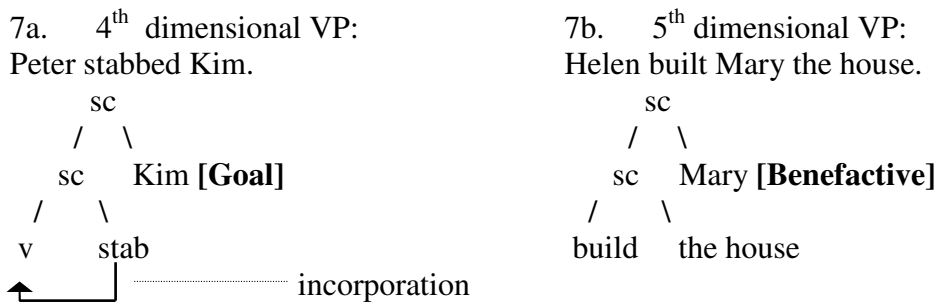
6. That board was built *e* to play with

e = ‘the children’

⁴¹ Lasnik (1988) argues that the examples I am about to discuss are not instances of syntactic control. I simply acknowledge this matter here, leaving any further qualifications for future research. I am indebted to H. Lasnik for bringing this point to my attention.

With that as background, I would like to argue that, given an appropriate context, an ‘eventive argument’ *that is not assigned a full NP as its referent in syntax* is nevertheless capable of controlling the implicit argument *e* of purpose clauses (cf.: Baker, Johnson, & Roberts, 1989). Specifically, I present data suggesting it to be crucial that, for this process to succeed, the verb involved must denote an Accomplishment.

Consider the difference in interpretation assigned to the Presentation for the 2nd dimension in the 5th dimensional VP (Accomplishment) *build* and that in the 4th dimensional VP (Activity) *stab*. The claim in section 2.1 was that the Presentation for the 2nd dimension is interpreted as ‘Benefactive’ in Accomplishments (the 5th dimension VP), but ‘Goal’ in Activities (the 4th dimension VP):



This amounts to saying that an element with benefactive characteristics in Accomplishments (the 5th dimension VP) is a syntactic argument, but should we find such a semantically characterized element associated to Activities (the 4th dimension VP), it would not be one such argument. I will assume that control in general, and

more concretely here of the implicit argument *e* in the passive variant of purpose clause, is possible *only by a syntactic argument*. If so the direct prediction is that an NP which is interpreted as Benefactive in Accomplishments (the 5th dimension VP) is able to control the implicit argument *e*, whereas it is not in structures corresponding to Activities (the 4th dimension VP). This is borne out, as I proceed to show.

Imagine the following scenario, where an Accomplishment (5th dimensional) predicate *build* is involved in the event underlined in 8:

8. The ABC Steel Company had the construction workers build Professor Angelou two office buildings. Professor Angelou's sole intention in accepting this offer was to raise the revenue of the American Poetry Society.

Under the scenario in 33, it is felicitous to say 9:

9. The two office buildings were built *e* to raise the revenue of the American Poetry Society [e = Professor Angelou]

This indicates that the Benefactive *Professor Angelou* is capable of controlling the implicit argument *e*, and thus a syntactic argument with the Accomplishment predicate (the 5th dimension) *build*.⁴²

⁴² An important qualification is in order. (i) is clearly ungrammatical when an anaphoric dependency is involved:

(i) The two office buildings were built *e* to raise (*her own) revenue [e = Professor Angelou]

Compare 8 with the following scenario, where the event underlined involves an Activity predicate (the 4th dimension) *stab*:

10. George is about to lose to Ron in the Presidential nomination. *The G.O.P. had a professional killer stab a pro-Ron VIP for/on behalf of George.* George accepted this offer with the sole purpose of beating Ron in the Presidential nomination.

In this instance, the implicit argument *e* of the purpose clause can not be construed as the Benefactive, *George*, as in 10. This suggests that the Benefactive *George* in 10 is not able to control the implicit argument *e*, and is therefore not a syntactic argument:

11. # This pro-Ron VIP was stabbed *e* to beat Ron in the Presidential nomination.
[*e* = George]

The contrasts in 8-11, concerning the control possibilities of the implicit argument *e* of the purpose clauses, receive a rather straightforward account from the perspective in this thesis. Benefactive is implied (i.e., is a simple syntactic argument) with the Accomplishment (5th dimensional) predicate *build*, but once again not (i.e., is not an argument at all) with the Activity (4th dimensional) predicate *stab*. This supports the architecture of the VP proposed here in two ways.⁴³

Apparently, whatever these implicit argument are, they cannot license standard anaphors, suggesting either a significant difference between binding and control, or a totally different analysis altogether. Recall in this regard Lasnik's skepticism, raised in the previous footnote.

My approach is strengthened, first, because the controller under investigation is actually implicit, and not only does my proposal have something to say about implicit arguments: they are furthermore crucial in establishing the appropriate lexical complexity for the verb. Second, because what we are showing in this instance is that pre-theoretical ‘roles’ like Benefactive do not have a primitive status. Or to put it differently, there is a Benefactive interpretation correlating with a Goal that integrates one step in the dimensional structure of a VP into what ends up being conceptualized as a complex Accomplishment, and a ‘benefactive’ interpretation (whatever that means) correlating with expressions with an adjunctal import associated to less complex eventualities. Only the former engage in relevant syntactic relations, such as control. It is not straightforward to capture this subtle distinction with a less articulated VP structure, including the ‘warping’ role I give the relevant argument. In a sense, I provided a similar argument in section 2.1 for locations, which could be interpreted as argumental (thereby warping the VP into a third dimension) or not –but

⁴³ M. Arnold (p.c.) pointed out to me that the example in 9 is felicitous only under the reading that *Professor Angelou* is made somehow into a ‘hidden Causer’. If this is not possible, then 9 is infelicitous. What one may be doing in construing 9 is somehow ‘stretching’ the event to include the Benefactive NP into the picture. The difference in judgment between 9 and 11 arises possibly because this ‘stretching’ of the event is extremely hard to do in 11, involving *stab*. That is, it is not hard to imagine a real situation where a Causer is involved in a *stabbing* event; however, *stab* somehow ‘slices’ reality narrowly, in such a way that a Causer is not involved in the picture. In contrast, *build* ‘slices’ reality thickly enough to include a Causer in the picture. I do not have a technical explanation for why Benefactive must be turned into a hidden Causer in 9. I would like to note, however, that this is exactly what one would expect if *build*, but not *stab*, implies a Causer, which is reflected in the higher dimensional Order of Complexity of the 5th dimension VP, *build*. For what is worth, I have asked six native speakers of English, five of which judged 9 to be felicitous, unlike 11.

of course that is a less powerful argument to make, given the status of locatives more generally.

3. 3. The ‘Lone Quantifier’ Test as a Probe for Argumenthood.

Once again, the SAAC hypothesis entails that the more complex an event becomes, the more arguments it requires to be appropriately presented. This subsection demonstrates again one aspect of this entailment via what I think of as the ‘lone quantifier’ test (T. Baldwin, p.c.).

Tim Baldwin proposes a ‘lone quantifier’ test to evaluate the argumenthood of a given element for a verbal predicate. To give a flavor of this test, first, in English, consider the sentence *six lawyers accused three judges two ways/times*, where obviously we want *six/three lawyers/judges* to appear in an argument position, while we expect *two ways/times* to be adjuncts. In Baldwin’s sort of test, we relativize the nominal expression associated to the numeral quantifier,⁴⁴ here *six/three/two*, and the observation is that the process succeeds only if the relativization process involves an argument. Thus compare: *Of all the judges, the lawyers accused three ϕ* / *Of all the lawyers, six ϕ accused the judges* vs. **Of all the ways/times, the lawyers accused the judges two ϕ* :

⁴⁴ Needless to say, the English example I have just given does not involve relativization, but I offer that instance (presumably involving some sort of topicalization) only in order to clarify the Japanese examples that do involve relativization.

The relevant contrasts are actually sharper and more general in a language like Japanese, as the following examples show:

Arguments:

Agents:

12a. kinou Hanako-ni atta huta.ri (no otoko)
 yesterday -dat met two.Classifier (gen men)
 (two [men] who met (Hanako) yesterday)

Themes:

12b. kinou Hanako-ga atta huta.ri (no otoko)
 yesterday -nom met two.Classifier (gen men)
 (two [men] whom (Hanako) met yesterday)

Adjuncts:

Reason phrases:

13. hon-o katta futa.tsu *(no-riyuu)
 book-acc bought two.Classifier *(gen-reason)
 (two [reasons] she bought the book for)

As in 12a, the Agent *two men* (in *Two men met Hanako*) or the Theme *two men* (in *Hanako met two men*) can both be relativized with the lone quantifier (plus the classifier) *futari* (two, as in human) floating, without the NP *otoko* (men). In contrast, example 13 attempts, and crucially fails, to relativize the adjunct phrase *two reasons* (in *Hanako bought the book for two reasons*). Notice that the morphological makeup of the phrases in 12 and 13 are exactly the same: they all consist of the numeral *futa-* (two-); the classifier *-ri-* (-person-) or *-tu-* (-entity-), and the nominal predicate *otoko* (men) or *riyuu* (reason). Example 13 is illicit precisely and only because the reason phrase is not an argument in this verbal predicate.

With that in mind, let us now apply this lone quantifier test to Benefactives again to test their argumenthood. To repeat, the verbal structure proposed here treats Benefactives as a syntactic argument in the 5th dimensional VP, only.⁴⁵ Then the prediction is that the lone quantifier floating of Benefactives is licit only in the 5th dimensional VP, not in the 4th, 3rd, or 2nd dimensional VP. This is borne out:

Benefactives:

14a. 5th dimensional VP:

Hiroshi-ga ie-o tateta futari
 -nom house-acc two.Cl
 (two [people] for whom Hiroshi built a house)

14b. 4th dimensional VP:

??Hiroshi-ga hasi-tta futari
 -nom run-past two.Cl.
 (two [people] for whom Hiroshi ran)

14c. 3rd dimensional VP:

?*Hiroshi-ga siai-ni kat-tta futari
 -nom game-dat win-past two.Cl.
 (two [people] for whom Hiroshi won a game)

14d. 2nd dimensional VP:

*Hiroshi-ga klasumeeto-o suki-dat-ta futar
 -nom classmate-acc like-affirm.-past two.Cl.
 (two [people] for whom Hiroshi liked his classmates)

Although this argument is different from the one in the preceding section (involving different syntactic relations, in particular relativization vs. control), and for

⁴⁵ Readers are reminded that for reasons yet to be formalized ‘Goals’ in lower-dimensional VPs, such as 2nd or 3rd VP, manifest themselves as Goals or Experiencers, but not as Benefactives that are syntactic argument.

a different language, its conclusions are of course rather similar: only some Benefactives are true arguments, which don't really follow if the notion 'benefactive' is primitive. I should say, also, that I am concentrating, now, on goals –that is, intermediate elements in the Thematic Hierarchy– because I am trying to stay away from the less fine-grained extremes of the hierarchy, Themes and Agent/Causers. That is, mostly every researcher would agree that the latter cut is real, but such a simple distinction could be accommodated merely in terms of the internal/external opposition that, for instance, Baker (2003) advocates. Things, however, get more complex the minute one has further refinements: it is then that a 'hierarchy', in a proper sense, emerges.⁴⁶ Interestingly, within that 'hierarchy' Themes continue to be special, which I already had a non-stipulative account of in section 2.1. But the question remains of what it is to have a 'hierarchy', what aspect of the model that can be blamed on. In the Dimensional Theory the syntactic answer is direct, and arguments of the sort just presented, in this section and in the previous, show that the syntactic take on the 'hierarchy' –particularly if it integrates as centrally as I suggest in the construction of the VP– is significantly more sound than an alternative based on extra-linguistic cognitive notions, even if these can be made explicit as in Jackendoff (1997).

⁴⁶ Of course, in principle one could have tested the hierarchy with any of the intermediate roles, including Locations or Agents. Unfortunately the latter, as far as I can tell, do not allow for very simple testings other than the one alluded to already for Locations, in this instance because this dependent has been customarily confused with adjuncts (in addition, irrelevant reasons that I won't go into make this test even more cumbersome). As for Agents, to be honest I have a hard time distinguishing them from Causers, although see section 2.3 on this matter. At any rate, to establish the hierarchy I take it that we only need to break away from the mere opposition internal vs. external (roles), which the arguments above clearly do.

3. 4. Aspectual Verbs and Selection.

Obviously, ‘Aspectual verbs’ –such as *start*, *complete*, *proceed*, etc.– select their complement VPs (i.e., they combine only with certain complement VPs):

15a. Bill completed [_{VP} building the house] (complement = 5th dimension VP)

15b. *Bill completed [_{VP} pushing the car] (complement = 4th dimension VP)

Less obviously, however, in this subsection I would like to claim that aspectual verbs make crucial selective use also of the *lower* dimensional Orders of Complexity in their complement VPs, thereby supporting the VP architecture proposed here.

The prediction of the Dimensional Theory with respect to the selectional properties of aspectual verbs is that one such verb which manages to select a VP with an nth order of complexity should also be able to combine with VPs with n + mth order of complexity, inasmuch as the latter logically presupposes the former.⁴⁷ This is so

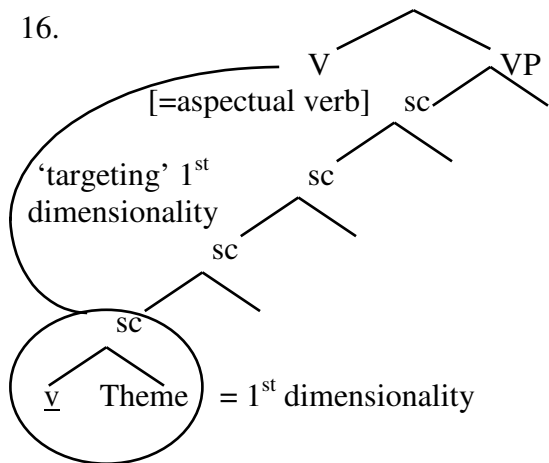
⁴⁷ Readers should keep in mind that, unlike in standard approaches (where, for instance, the fact that a category selects a TP doesn’t entail that it can also select a CP), the way dimensional projections are constructed nothing could prevent selecting *into* an inner layer of structure, as these are all of the same (here VP) type. The analogy with a geometrical system is a better one. An operation bisecting an angle, for instance, will be able to take place regardless of whether this angle appears in the two dimensions of the plane, the three dimensions of a hyper-plane, or anything more complex which is still an angle (even if it is within heavily warped hyper-spaces). In effect, the dimensional structuring of VPs is asserting that the higher dimensional

because of the inductive nature of the dimensions in VPs, a fact observable for nominal spaces too, a point that Muromatsu (1998) makes. Thus a verb, like *chop* that selects for a mass-noun like *meat* can also select a count noun like *cow*, as in *Jack chopped the cow (into small pieces)*, as a result of the count noun presupposing a mass expression as well. The opposite is not the case. Thus a verb, like *count* that selects for a count-noun like *cow* cannot select a mass noun like *meat*, as in **Jack counted (the) meat*.⁴⁸ This is thus a strong argument for the *dimensional* (presuppositional) organization of the VP layers, a result that would not be easily achievable if the various lexical sorts were characterized merely in terms of unorganized features, like the traditional [+/-count] or [+/-mass].

Now consider an aspectual verb which selects the 1st dimensionality of a VP as its complement. Of course, the 2nd, 3rd, 4th, and 5th dimensional VPs all imply the 1st dimensionality of the VPs. Then, the aspectual verb in question should in principle be able to take the 2nd - 5th dimensional VPs as its complements while ‘targeting’ the 1st dimensionality of its complement VP, as in 16:

objects are of the same type as the lower dimensional ones, and furthermore recursively defined on the latter.

⁴⁸ Inasmuch as this expression receives an interpretation, it does so if we somehow coerce *the meat* into count units, as in *the meats* (which normally stands for meat sorts, or some such thing). Thus compare **Jack counted meat* vs. *Jack counted the meats*.



This prediction is borne out. For example the aspectual verb *continue* selects the 1st dimensional VP *exist*, and it combines with all the 2nd - 5th dimensional VPs:

- 17a. God continued existing
- 17b. God continued loving Mary
- 17c. God continued winning the game
- 17d. God continued pushing the cart
- 17e. God continued building the temple

As the chart below shows, no aspectual verb selects the 1st dimension VP while not taking the 2-5 dimensional VPs as complement. More generally, aspectual verbs selecting an nth dimensional VP may take n+mth dimensional VPs as their complements, but not n-mth dimensional VPs, as chart 2 below attempts to shows. Needless to say, if dimensions are real, in that they determine the selectional

properties of aspectual verbs, the inductive nature of the present proposal is directly confirmed:

Chart 2: Possible combination of aspectual verbs and VP complements:

complement aspectual V	1 st dimension VP: exist	2 nd dimension VP: love Mary	3 rd dimension VP: win the game	4 th dimension VP: push the car	5 th dimension VP: build the house
<i>start</i> <i>begin commence</i> ⁴⁹ <i>keep</i> <i>continue</i> <i>proceed</i> <i>resume</i> <i>repeat</i> <i>avoid</i> ⁵⁰ <i>stop</i> <i>cease</i> <i>quit</i> ⁵¹	OK	OK	OK	OK	OK
<i>Launch</i>	*	OK	OK	OK	OK
<i>Halt</i>	*	*	OK	OK	OK
<i>initiate</i> <i>inaugurate</i>	*	*	*	OK	OK
<i>institute</i> <i>complete</i> <i>finish</i>	*	*	*	*	OK

⁴⁹ Restrictions on style of usage apply at least to *commence*. However, it is acceptable to say, for example, *commence drinking* in ‘humorous in other than solemn contexts’ (*The Penguin Modern Guide to Synonyms and related words*: 38.) From the data given by native speakers of English, I suggest that the restriction on usage with respect to this aspectual verb is due to some extra-grammatical factor.

⁵⁰ The following examples are acceptable (Lilly, J. (p.c.)):

- (i) The Dalai Lama repeated existing. The Dalai Lama avoided existing this time.

The restriction on combination of *repeat*, *avoid* and *exit* is only apparent.

⁵¹ When combined with *notice the spot* or *win the lottery*, aspectual verbs like *stop*, *cease*, *quit*, require for the event denoted by the complement VP to be repeated, as in:

- (i) Bill stopped noticing the spot on his sleeve when he finished the dinner.

But this use seems licit. Note the same strategy is not available, e.g., for *complete*:

- (ii) *Bill completed noticing the spot when he finished his dinner
 (iii) *Bill completed loving Mary when he met Tom

I must add, however, that future work should help us understand why particular aspectual verbs go with the various dimensionalities. This is of course true also about more standard selectional restrictions between regular verbs and nouns, of the sort Muromatsu explored. Unfortunately, while it seems straightforward to understand why a verb like *count* likes to select a count noun, it is certainly harder to see, in full generality at least, why the various verbs in Chart 2 go with the selectional characteristics that they seem to exhibit. This awaits future serious research. That said, though, it should be clear that a non-dimensional treatment of the sort I sketch here, and in particular one that merely relies on the listing of properties associated to lexical features (e.g. [+/- state], etc.), will not be able to capture these easy to observe restrictions in non-stipulative ways.

3. 5. Benefactives and Goals: Diagnostics.

I have been arguing for the SAAC Hypothesis, which determines the dimensional complexity of a verb: the higher the order of dimensionality, the more syntactic arguments it has. The crucial word here is, of course, *syntactic* argumenthood. How we determine that something is, indeed, a syntactic argument becomes, hence, an interesting and subtle matter. I have already alluded to co-occurrence restrictions of locative elements with stative verbs such as *like* in this regards (see chapter 2, section

2.2.2). But we need stronger evidence for the admittedly strong claim the SAAC Hypothesis is making.⁵²

To assume an argument/adjunct distinction is to assume, to start with, that certain elements are more closely connected than others to the dimensional structures that a predicate associates with. Intuitively, for instance, *of John* is an argument in 18a, but *near John* is not in 18b (let's ignore, for now, the indices):

- 18 a. Which picture *of John*_(i) did he_(i/*j) destroy?
b. Which pictures *near John*_(j) did he_(i/j) destroy?

But I have already noted (for instance in chapter 2 fn. 20) that 'close connection' is too vague a diagnostic. Does it imply, for instance, *obligatoriness* of a dependency? The answer must be now, for as Grimshaw (1990) already observed, that would predict that certain obligatory adverbials (e.g. *badly* in *John behaves *(badly)*) ought to be considered arguments. I do not know why that particular obligatoriness happens to obtain, but it can have nothing to do with the dimensional shifts I speak of here, since adverbial dependencies –obligatory as they may be– do not obviously contribute to the nuances of Aktionsart. In turn, although it is certainly true that my SAAC Hypothesis expects the converse situation to obtain (an argument must be an obligatory dependent), this cannot be turned into an easy test for argumenthood,

⁵² For reasons already mentioned in fn. 20, and also because this is a sort of lexical dependent that can easily appear in adjunct guise, I will concentrate only on testing the argumenthood of Benefactives and Goals, although in principle similar or other tests could be used for other lexical dependencies.

because as we saw in chapter 2, section 2.2.2, many of the necessary arguments are either merely implicit or appear masked as incorporated elements, leaving no direct lexical material in the relevant argument position. All that this means, however, is that we must create more elaborate argumenthood tests, to decide whether the hypothesized arguments behave as expected. Luckily this can be done.

3. 5. 1. Benefactives: Amelioration of Obviation Effects.

Lebeaux (1988), following ideas from Freidin (1986), made much of the fact that – now considering the specific indices in (42)– arguments and adjuncts fare differently with regards to so-called obviation effects (as is indicated by the relevant star associated to pronoun co-indexation in the case of a name in argument position). In truth, it is not relevant to me why this difference obtains: just that it obtains, as it can be used as a diagnostic for argumenthood. As a matter of fact, I will be working with significantly different contexts and indeed also significantly different judgments,⁵³ which again I have no explanation for. Nonetheless, I will take it that the *contrast* between arguments and adjuncts is what counts for our purposes, since we can use that as a way, hopefully among others, to tease arguments apart from adjuncts.

⁵³ I could not use Lebeaux's particular contexts because he was dealing with nominal, not verbal, dependents.

3. 5. 1. 1. A Clausal Pied-Piping Context.

Consider the following contrasts, where relevant readings again involve obviation effects between co-indexed elements:

[Wh pied-piping]:

19a. ??That Mary destroyed which pictures of John_i, did he_i say?

19b. *?That Mary destroyed which pictures near John_i, did he_i say?

In 19 the whole complement clause of matrix verb *say* is pied-piped with the *wh*-element. (I call these merely ‘pied-piped constructions’, for ease of exposition.)

Curiously, there is a notable difference in grammaticality between 19a and 19b, as indicated. In my own informal testing of these matters, with dozens of individuals, I found out that roughly 66% share the judgments in 19, and for the remaining 33%, matters are less obvious one way or the other.⁵⁴ This indicates that arguments such as *of John* in the pied-piped complement in 19a ameliorate obviation violations, as opposed to adjuncts such as *near John* in 19b.⁵⁵ Let us assume this to be the case.

⁵⁴ 24 out of 36 native speakers of English have judged 19a to be more acceptable than 19b under the co-reference reading of *John* and *he*.

⁵⁵ Again, unlike what we see for complement pied-piping in 19, arguments are *less* well-formed for the intended, co-referent, reading in 18. I don’t intend to analyze this fact, but simply to provide a correlation that I can use as evidence for argumenthood. For what it’s worth, note in any case that the facts in 19 are actually not in direct contradiction with those in 18. Here both *wh*-phrases are contained within a complement first (the displaced clausal complement of *say*). Apparently, when this element is pied-piped, for some reason it tolerates relevant co-reference between a name and an indirectly *c*-commanding pronoun, but *only if the antecedent is itself an argument*.

To recall, verbal structures with the 5th order of dimensional complexity have Benefactives as their syntactic arguments in my proposal, not the ones with the 3rd or even the 4th order of dimensional complexity. If indeed (clausal) pied-piping as in 19 is sensitive to the argumenthood of phrases fronted with the wh-element, with respect to obviation effects involving Benefactives, I predict that native speakers rank 5D verbs the best, then 4D verbs, and lastly 3D verbs. This prediction is borne out. In 20, the Benefactive *for John* is pied-piped along with the clausal complement:

- 20a. ??That Mary brought what for John_i did he_i say? 5D verb: bring
 20b. ?*That Mary pushed what for John_i did he_i say? 4D verb: push
 20c. ??*That Mary reached where for John_i did he_i say? 3D verb: reach

20d.
 Grammatical judgments (of 25 informants):

	3a: <i>bring</i> : 5D	3b: <i>push</i> : 4D	3c: <i>reach</i> : 3D
Best	19 (76%)	4 (16%)	2 (8%)
2 nd best	3 (12%)	16 (64%)	6 (24%)
Worst	3 (12%)	5 (20%)	17 (68%)

As indicated in 20d, a total of 19 out of 25 informants consulted chose the 5D verb *bring* as the most tolerant predicate for relevant obviation effects as in 20 (76% of my informants). This is to be compared to the structure in the 4D verb *push*, chosen as second best by (68%) of my informants, and the 3D verb *reach*, judged by 68% of my

informants to be the least preferred verb for the intended readings in 20. This pattern is easily accounted for under the current proposal with no extra machinery.

To illustrate this point further, specific acceptability rankings for the verbs in 20 are given in combination.

21. Rankings:

Acceptability order (from left to right):	Number of informants:	Percentage of informants:
bring-push-reach: (5D-4D-3D)	15	60 %
bring-reach-push: (5D-3D-4D)	4	16 %
push-bring-reach: (4D-5D-3D)	3	12 %
push- reach-bring: (4D-3D-5D)	1	4 %
reach-bring-push: (3D-5D-4D)	0	0 %
reach-push-bring: (3D-4D-5D)	2	8 %

Quite simply: 60% of my informants opted for the 5D-4D-3D acceptability order, judging the sentence involving the 5D verb *bring* (20a) to be the best, then the one with the 4D verb *push* as second best (20b), and the one involving the 3D verb *reach* (20c) to be dead last, directly as predicted.

Note that, for my purposes, it suffices if I can establish a sharp contrast between the 5D verb *bring* on one hand, and the 4D and 3D verbs *push/reach* on the other, as only in the former instance is a Benefactive merged as an argument. Indeed, 76% of the informants judged the 5D verb *bring* to be the most appropriate in 20, as indicated by the shaded areas in 21. Given the topological makeup of the syntactic architecture, I also expect that 4D verbs should be preferred over corresponding 3D verbs when it

comes to forcing relevant obviation facts. This is the case for 76% of my informants.⁵⁶

Although I am well aware of the fact that relevant tests should be replicated with more speakers and, above all, more relevant verbs, the strength of these results seems to me rather encouraging.

3. 5. 1. 2. A VP-Fronting Context.

The phenomenon of VP-fronting provides us with a somewhat analogous argument-adjunct grammaticality contrast, as in 22:⁵⁷

[VP-fronting]:

22a. ??Mary said John would destroy pictures of himself,
and sure enough: destroy pictures of John_i he_i did!

22b. *?Mary said John_i would destroy pictures near him_i,
and sure enough: destroy pictures near John_i he_i did!

⁵⁶ In alternative, familiar, proposals in the literature, for instance those in Baker (2003) or Borer (2005), the facts just reported cannot be easily accounted for. These sorts of proposals need to explain why it is that Benefactives associate differently to various layers of Aktionsart, something which follows naturally given the SAAC Hypothesis.

⁵⁷ In my informal testings on this matter, 10 out of 16 native speakers of English (65%) have judged 22a to be preferable over 22b under the intended, coreferential, reading involving *John* and *he*. (For clarity, relevant nominals are underlined in 22.)

Again, by the same logic displayed in the pied-piping instances in the previous subsection, I use this grammaticality contrast as a probe for the argumenthood conditions of a given predicate.⁵⁸ Application of this construction to Benefactives clearly supports argumenthood of Benefactives in the 5th order of verbal constructions, as I proceed to show:

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 23a. ??Mary said John would build a house for himself,
and sure enough: build a house for <u>John</u> _i <u>he</u> _i did! | 5D verb: build |
| 23b. ?*Mary said John would push a car for himself,
and sure enough: push a car for <u>John</u> _i <u>he</u> _i did! | 4D verb: push |
| 23c. *Mary said John would reach a summit for himself,
and sure enough: reach a summit for <u>John</u> _i <u>he</u> _i did! | 3D verb: reach |
| 23d. *Mary said John would arrive at an airport for himself,
and sure enough: arrive at an airport for <u>John</u> _i <u>he</u> _i did! | 3D verb: arrive |

The grammaticality judgments indicated in 23 are, once again, a direct reflection of the significant preference of native speakers for the 5D verb *build* over the others.

This is illustrated in 24 and 25:

⁵⁸ Note that, as observed in fn. 54 above, here too we are dealing with a displaced phrasal complement, in this instance the VP directly associated to T. Again this seems to be a factor in marginally licensing the relevant coreference when the antecedent is an argument.

24. Grammatical judgments (of 14 informants):

	6a: <i>build</i> : 5D	6b: <i>push</i> : 4D	6c: <i>reach</i> : 3D	6d: <i>arrive</i> : 3D
Best	11 (79%)	0	3 (21%)	0
2 nd best	1 (7%)	10 (71%)	2 (14%)	1 (7%)
3 rd best	2 (14%)	1 (7%)	4 (29%)	7 (50%)
Worst	0	3 (21%)	5 (36%)	6 (43%)

25. Rankings:

Acceptability order (from the left to the right):	Number of informants:	Percentage of informants:
build-push-reach-arrive: (5D-4D-3D-3D)	3	21%
build-push-arrive-reach: (5D-4D-3D-3D)	5	36%
build-reach-push-arrive: (5D-3D-4D-3D)	1	7%
build-arrive-push-reach: (5D-3D-4D-3D)	0	-
build-reach-arrive-push: (5D-3D-3D-4D)	1	7%
build-arrive-reach-push: (5D-3D-3D-4D)	1	7%
push-build-reach-arrive: (4D-5D-3D-3D)	0	-
push-build-arrive-reach: (4D-5D-3D-3D)	0	-
push-reach-build-arrive: (4D-3D-5D-3D)	0	-
push-arrive-build-reach: (4D-3D-5D-3D)	0	-
push-reach-arrive-build: (4D-3D-3D-5D)	0	-
push-arrive-reach-build: (4D-3D-3D-5D)	0	-
reach-build-push-arrive: (3D-5D-4D-3D)	0	-
reach-build-arrive-push: (3D-5D-3D-4D)	1	7%
reach-push-build-arrive: (3D-4D-5D-3D)	2	14%
reach-arrive-build-push: (3D-3D-5D-4D)	0	-
reach-push-arrive-build: (3D-4D-3D-5D)	0	-
reach-arrive-push-build: (3D-3D-4D-5D)	0	-
arrive-build-push-reach: (3D-5D-4D-3D)	0	-
arrive-build-reach-push: (3D-5D-3D-4D)	0	-
arrive-push-build-reach: (3D-4D-5D-3D)	0	-
arrive-reach-build-push: (3D-3D-5D-3D)	0	-
arrive-push-reach-build: (3D-4D-3D-5D)	0	-
arrive-reach-push-build: (3D-3D-4D-5D)	0	-

In 25, the two shaded acceptability orders –namely, ‘build-push-reach’ and ‘build-push-arrive– share in common the 5D-4D-3D order. (These two comprise 57% of all

the preferred orders for the intended readings in 23.) Again, this percentage by itself is by far the largest of all the orderings natives accepted. Moreover, the individuals who opted for the 5D verb *build* as their best choice for 23 constitute 78% of all my informants. This, again, sharply illustrates a distinct contrast between the 5D-4D-3D acceptability order and the rest, in accordance to the topological makeup of syntactic objects, and also in line with my substantive claim about argumenthood of Benefactives.

3. 5. 2. Benefactives: Wh-Extraction Over a Weak Island.

Lastly, I will discuss sheer wh-extraction of Benefactives over a weak island. In this instance, the argument need not be very sophisticated (and recall the discussion in section 3.5.1). As Cinque (1991) reminds us, reviewing a vast literature, only arguments of a predicate tolerate extractions over weak islands, vis-à-vis comparable extractions involving adjuncts. Applying this diagnostic directly to Benefactives of various orders of verbal dimensional complexities, we see, again, that Benefactives are arguments with 5D verbs such as *build* or *bring*.

First, I present wh extractions with the P⁰ *for* stranded, involving 36 informants. My informants rather robustly show that Benefactives can be more easily extracted over a weak wh-island in a construction involving the 5D verb *build*, vis-a-vis the 4D *push* or the 3D *arrive*:

- 26a. ??Whom do you wonder whether Bill built a house for? 5D verb: *build*
- 26b. ?*Whom do you wonder whether Bill pushed a car for? 4D verb: *push*
- 26c. *Whom do you wonder whether Bill arrived at an airport for? 3D verb: *arrive*

Further examination of the relevant patterns reveals that the preferred order is clearly 5D-4D-3D:

27. Grammatical judgments (of 36 informants):

	12a: <i>build</i> : 5D	12b: <i>push</i> : 4D	12c: <i>arrive</i> : 3D
Best	23 (64%)	9 (25%)	4 (11%)
2 nd best	9 (25%)	20 (56%)	7 (19%)
Worst	4 (11%)	7 (19%)	25 (69%)

28. Rankings:

Acceptability order (from left to right):	Number of informants:	Percentage of informants:
build-push-arrive: (5D-4D-3D)	19	53%
build-arrive-push: (5D-3D-4D)	4	11%
push-build-arrive: (4D-5D-3D)	6	17%
push-arrive-build: (4D-3D-5D)	3	8%
arrive-build-push: (3D-5D-4D)	3	8%
arrive-push-build: (3D-4D-5D)	1	3%

As 28 shows, 53% of my informants chose the 5D-4D-3D preference order for 50.

This figure is more than three times higher than the next (17%), for an ordering inverting the hypothesized 4D element over the hypothesized 5D one, acceptable to 6 speakers. In addition, note that a total of 64% of the informants chose the 5D verb *build* as their best option for the test. This, again, further supports the argumenthood

of Benefactives in the 5D dimensional verbal structure, and thus the underlying topological architecture of the C_{hl} .

Lastly, I discuss analogous extraction facts with P^0 pied-piped, obtained for 40 informants:

- 29a. ??For whom do you wonder whether Bill built a house? 5D verb: *build*
 29b. ?*For whom do you wonder whether Bill pushed a car? 4D verb: *push*
 29c. ??*For whom do you wonder whether Bill arrived at an airport? 3D verb: *arrive*

As readers can easily verify, this version of the wh-extraction test yields similar results to the one without P^0 -stranding, though for some reason to a lesser degree than the previous three tests:⁵⁹

30. Grammatical judgments (of 40 informants):

	9a: <i>build</i> : 5D	9b: <i>push</i> : 4D	9c: <i>arrive</i> : 3D
Best	24 (60%)	11 (28%)	5 (13%)
2 nd best	10 (25%)	19 (48%)	10 (25%)
Worst	6 (15%)	10 (25%)	24 (60%)

⁵⁹ This might have to do with the fact that not stranding prepositions is a learned alternative for most speakers of American English.

31. Rankings:

Acceptability order (from left to right):	Number of informants:	Percentage of informants:
build-push-arrive: (5D-4D-3D)	14	39%
build-arrive-push: (5D-3D-4D)	8	22%
push-build-arrive: (4D-5D-3D)	3	8%
push- arrive-build: (4D-3D-5D)	7	19%
arrive-build-push: (3D-5D-4D)	3	8%
arrive-push-build: (3D-4D-5D)	1	3%

As 31 shows, 39 % of my informants opted for the 5D-4D-3D acceptability order, ranking the 5D *build* to be the best choice among the sentences in 29, the 4D *push* as second best, and the 3D *arrive* as the worst (almost twice as much as the next highest figure, for the 5D-3D-4D ordering that 22% of speakers accept). Moreover, as indicated in 30, 60% of all informants preferred the 5D verb *build* as their best choice, as opposed to 28% for the 4D *push* or 13% for 3D verb *arrive* in 29. Once again these figures are in line with the previous, in support of the argumenthood of Benefactives in the 5th order of verbal dimensional complexity, and the preference for the 5D-4D-3D ordering, as seen before.

In this subsection, I discussed the argumenthood of Benefactives in various orders of dimensional complexities, in regards to obviation ameliorations and wh-extractions. I relied on three classes of tests for the argumenthood of Benefactives: complement clause pied-piping, VP fronting, and wh-extraction over a weak island (both P⁰-stranding and P⁰ pied-piping). These tests clearly support the proposal that Benefactives are syntactic arguments in the 5th order of verbal dimensional complexity, as well as the overall topological framework that the proposal is built on.

3. 5. 3. Some Comments about Goals in the 3rd and 4th Dimensions.

In the previous subsection, I have argued that Benefactives are syntactic arguments for the 5th order of dimensional complexity. In this subsection, I illustrate that Goals are syntactic arguments in the 4th order of verbal dimensional complexity, but not in the 3rd one. The evidence I present is based on *wh*-extraction of Goal phrases over a weak island.⁶⁰

For sentences as in 32, the overwhelming majority of my informants opted for the 4D verb *walk* over the 3D *arrive* in sanctioning extraction of a Goal phrases in P⁰ pied-piping constructions –84%, to be exact:⁶¹

32. a. ??To where do you wonder whether Bill pushed a car?
b. ?*Where do you wonder whether Bill arrived?

These data strongly suggest that Goals are represented as syntactic arguments in the 4D verb, but what looks like a Goal in the 3D verb is actually not a syntactic argument. An equally large number of informants (79%) chose the 4D verb *walk* over

⁶⁰ In this section, I compare only 3D verbs and 4D verbs. I have tried to find 5D verbs with what looks like a Goal PP. However, it is hard to distinguish a Goal and a Benefactive in the 5D verbs. This by itself is indicative that theta-roles form a hierarchy in the CI component.

⁶¹ In my informal testings on this matter, 16 out of 19 informants opted for *push* in 32a over *arrive* in 32b. Note, curiously, that the expression ‘to where’ is often stigmatized in normative grammars, as opposed to the standard *Where did bill arrive?*

the 3D *arrive* in analogous extraction of Goal phrases over a weak island, further strengthening the proposed structure:⁶²

33. a. ??To where do you wonder whether Bill walked?
b. ?*Where do you wonder whether Bill arrived?

The fact that Goals are syntactic arguments in the 4D verbal structures, but not in the 3D ones, complements my previous discussion on the argumenthood of Benefactives. Before, I have shown that Benefactives are syntactic arguments with the 5th order of verbal dimensional complexity, not with 4th or 5th ones. Benefactives and Goals are then indeed selectively realized as syntactic arguments, depending on the overall complexities of the lexical verbs they are associated with. The test results in this section fully support the substantive *syntactic* structures of lexical verbs proposed here.

3. 5. 4 About the Counterexamples.

I would like to add a word on those speakers accepting structurings that my theory does not predict. These are my worst counterexamples:

⁶² 15 out of 19 informants chose *walk* in 33a over *arrive* in 33b.

34. Weighing the Counterexamples:

Type of Counterexample	Percentage of informants:
Benefactive Obviation in pied-piping good for 3D verbs	8%
Benefactive Obviation in pied-piping good for 4D verbs	16%
Benefactive Obviation in VP fronting good for 3D verbs	21%
Benefactive Obviation in VP fronting good for 4D verbs	11%
Benefactive Extraction w/o P stranding viable for 3D verbs	11%
Benefactive Extraction w/o P stranding viable for 4D verbs	27%
Benefactive Extraction w P stranding viable for 4D verbs	25%
Goal Extraction viable for 3D verbs	18%

In a nutshell, up to a fourth of my informants give me unexpected data, especially in the extraction paradigms. Of these, the worst involve absence of P stranding, although as I mentioned in fn. 59 this might be because this option is not natural to contemporary American English speakers.

I believe that, first of all, this is simply a matter to pursue further, sharpening if possible the experimental design and extending it in appropriate ways. But I do want to add one more comment about data. I would submit that predicting things right roughly 75% of the time (at worst) is not bad, particularly in a field where all too often data come from analysts' own intuitions. It is easy to derail just about any project, particularly one involving more or less shaky lexical intuitions, by simply asserting that one doesn't get the data. My informal experiments, with quite a few speakers, suggest a clear pattern. It remains to be seen why not everyone agrees 100% of the time –or in other words, what assumptions about argumenthood speakers in the minority have.

One possibility that I will just mention, in particular with regards to the discussion in chapter 7 of Uriagereka (forthcoming), is that the most solid intuitions would correspond –if this could even be tested– to young children. I hope, at any rate, that my prediction is most solid at the point where it matters most: when acquiring the lexicon. That matters would gain in complexity later on in life, as everything else does, while intriguing is ultimately not very relevant to my architectural concerns here.

3. 6. Summary.

I have tested the model I have sketched in chapter 2, going for that into a variety of paradigms. I should say that I can assume virtually everything research has told us about Thematic Relations, if these are understood roughly in the sense in Hale and Keyser (1993, 2002). I could have fished, therefore, on a rich pool to provide many customary arguments to show that all of this part of the theory is well and alive. But I took that for granted. What I wanted to show in this chapter was, specifically, that the SAAC Hypothesis makes good theoretical and empirical sense. For the latter aspect, it was central for me to show that we are not dealing with mere lists of primitive ‘theta-roles’ with a characteristic interpretation (say, Benefactive). I did this in three ways.

I showed, first, that such pre-theoretical semantic notions can end up assuming true argumenthood, or stay instead as mere adjuncts of some sort, all of it depending

on the role they play in projecting the VP, in the dimensional way I explore throughout this thesis. Second, when argument status is achieved for a given dependent with some relevant semantic characteristic, other hierarchical and connectivity properties ensue for it, in ways that we are accustomed to for arguments. (I tested that at length, in various ways, in the last section.) But in addition to this – and this is my third ‘complexity’ argument– I provided evidence that the organization of relevant argumental dependents is much tighter than familiar phrase-markers would lead us to expect. Arguments in my view shape-up hierarchically, in a way that correlates naturally with the semantic network of entailments they determine within VP. This starts with Themes, special arguments that virtually count as defining for verbal projections. Moreover the remaining arguments, which I have thought of as ‘event-participants’, articulate the VP in dimensional terms, which I have found perhaps the best evidence for in the ‘porous’ way in which selection restrictions by aspectual verbs obtain.

Much work lies ahead, especially in ensuring that the syntax/semantics mapping is indeed fairly trivial –that is, minimalist. The gist of my proposal is that the dimensional syntax explored here is best seen as ‘swinging’, determining raw mental spaces at one dimension, and next some sort of boundary for that space, a characteristic that is repeated for hyper-spaces created in association to bi-clausal situations involving light verbs. This all has to be clarified further: what is the relevant topology, why it arranges itself the way it does (how the ‘warps’ ultimately work), or how the hyperspaces emerge in higher dimensions –why they are associated

to bi-clausal syntax, involving a true lexical verb and some light auxiliary. I will return briefly to these matters in chapter 7, but the fact that they remain open and elusive doesn't seem to me to be a reason not to explore them.

I have articulated my notions in ways that map straightforwardly into semantic observables, if there are any. About the conceptual and theoretical part, I have relatively little doubts: they are what they are, and certainly at least consistent with the Minimalist Program. But I was the first to be surprised by the fact that the empirical results were roughly 75% right, at least. I build on this in the ensuing chapters.

Chapter 4: Modification Matters.

In this Chapter, I present aspect-sensitive data that receives a natural account in terms of the VP structure studied here, with the modifications to the Dimensional Theory that I have suggested in chapter 2. Specifically, I discuss the important analysis in Pustejovsky (1991) on adverbial modification within VP by *almost* and *in X-amount of time*, and compare it with the one that becomes possible within my approach. My arguments up to this point concerned, on the one hand, argumental properties of (some of) the elements that establish the various VP dimensions as per the SAAC Hypothesis, and on the other argumental properties of the VP layers taken as a whole, when selected by aspectual verbs. Now I will put argument issues aside, and will be mostly concerned, instead, with fine-grained modifications within the different dimensions, basically showing how we need all the various layers of VPs that the different arguments determine. I should say, though, that the arguments in this chapter resemble somewhat those in chapter 3, inasmuch as they pertain to a relation holding *into* lower dimensions across a higher dimensional space (though not the other way around).

Aside from its obvious virtues, the analysis in Pustejovsky (1991) has three potential problems: (a) it predicts the presence of an aspectual class which is actually non-existent: (b) it relies on an arbitrary ‘argumenthood’ of the event type *P* for the adverbials, and: (c) it makes incorrect predictions concerning some of the interpretations of the adverbials. These problems stem from the postulation of a mutually exclusive relationship between the Activity and Achievement notions, as

well as a general methodology that relies on meaning postulates to define various Aktionsart classes.

4. 1. Modification by ‘*Almost*’.

The adverbial ‘*almost*’ yields an ambiguous interpretation with an Accomplishment (1c), but not with an Achievement (1a) or an Activity (1b):

1a. Kate almost won the lottery [3rd dimension: Achievement]

1b. Kate almost swam [4th dimension: Activity]

1c. Kate almost painted the picture [5th dimension: Accomplishment]

Examples 1a, 1b, and 1c all have the readings wherein ‘winning the lottery’, ‘swimming’, or ‘the act of painting the picture’, respectively, did not take place at all. In addition to this, only 1c has an extra reading that ‘the act of painting the picture’ took place, but Kate did not complete the picture.

4. 1. 1. Pustejovsky (1991)’s Account.

Pustejovsky proposes an account for the aspect-sensitive construals of *almost* in terms of three primitive event types within the framework of lexical semantics. The three event types are: *State (S)*, *Process (P)*, and *Transition (T)*. *S* is a state of affairs and does not have any sub-event. *P* is an event made up of homogeneous sub-events that a predicate denotes. *T* is an event which consists of two event types.

Achievements and Accomplishments are assigned the representation *T* with the event type *P* temporally preceding *S*. Activities are represented as *P*, and States are

represented as *S*. None of this is accidental or atypical in the relevant literature, which serves itself liberally from notions of this sort, postulating them anew whenever this is deemed necessary to account for the observable data, and axiomatically mapping them to corresponding syntactic objects with the sole constraint of having them work, empirically.

Notice first that because Pustejovsky merely combines event types to describe Aktionsart, he should be in principle predicting the existence of an aspectual class that can be represented as *T*, with the event type *S* temporally preceding *P* –as a matter of mere combinatorial logic. This is contrary to fact, and must be assumed separately. Again, I don't think this is either accidental or atypical in the literature, which seems to have no scruples in adding relevant negative stipulations when the descriptive apparatus turns out to be too powerful –if such overgenerations are even noticed.

Pustejovsky assigns the following representations for modification of *almost* with Activity, Achievement, and Accomplishment predicates:

2a. Activity:

Kate almost swam

$$\begin{array}{c}
 P\text{--[almost (P)]} \\
 / \quad \backslash \\
 e_1 \dots e_n \\
 \backslash \quad / \\
 \text{swim (k)}
 \end{array}$$

2b. Achievement:

Kate almost won the lottery

$$\begin{array}{c}
 T \\
 / \quad \backslash \\
 P \quad S\text{--[almost (S)]} \\
 | \quad | \\
 [\neg \text{win (k, l)}] \quad [\text{win (k, l)}]
 \end{array}$$

2c. Accomplishment:

Kate almost painted the picture

$$\begin{array}{c}
 T \\
 / \quad \backslash \\
 P\text{--[almost(P)]} \quad S\text{--[almost(S)]} \\
 | \quad | \\
 | \quad [\text{picture(k)}] \\
 [\text{act(k,y)} \& \neg \text{picture(y)}]
 \end{array}$$

The adverbial *almost* is taken to be a one-place predicate which takes an event type *P* or *S* as its argument. Since an Activity is solely made up of one event type *P* which serves as an argument of *almost*, the adverbial *almost* yields an unambiguous interpretation (2a). Likewise, since *P* in an Achievement does not qualify as an argument of *almost* by assumption, there is only one event type *S*, and *almost* is construed unambiguously (2b).

In contrast, an Accomplishment contains two event types, *P* and *S*, both of which qualify as an argument of *almost* (2c). Needless to say, this allows only an Accomplishment to yield the ambiguous interpretations by the modification of *almost* in Pustejovsky's proposal.

4. 1. 2. Modification by '*Almost*' in the Dimensional Theory.

To repeat, in the Dimensional Theory, the complexity of events is directly encoded in (or rather, *as*) the architecture of the VP. I argue that the ambiguous readings of *almost* are merely the consequence of these dimensions being available as modification sites for *almost*, in much the same way as I showed in chapter 2, section 5 that lower dimensions within a higher dimension can be targeted for selection by given aspectual verbs normally selecting a lower dimension (though not the other way

around).⁶³ This allows us to straightforwardly account for the data in 55, without any additional assumptions, as well as other data that cannot be readily accounted for by the proposal in Pustejovsky.

For concreteness, I assume that the relevant modification takes place in terms of the following structural relationship, from Sportiche (1988: 429) –other, more elaborate, notions could do the job, but we need not go into that here:

3. The Adjunct Projection Principle:

If some semantic type X modifies some semantic type Y, and X and Y are syntactically realized as A and B, A is projected as *an adjunct of B*.⁶⁴

According to the structure of the VP proposed here, each order of complexity is represented as a small clause (see chapter 1). As should be familiar by now, the (5th dimensional) Accomplishment predicate has a more complex syntactic structure than the (4th dimensional) Activity or (3rd dimensional) Achievement predicates. All other things being equal, then, given the Adjunct Projection Principle, an Accomplishment predicate should yield more readings than an Activity or Achievement predicate.

⁶³ Muromatsu (1998) makes a formally identical point for adjectival modification within nominal dimensions.

⁶⁴ The italicized portion is my revision. The original version has ‘*adjacent to*’ instead.

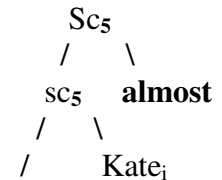
Essentially, possible modification sites by *almost* in the 3rd, 4th, and 5th dimensions are as follows:⁶⁵

4a. 3rd dimension:
[Achievement]
Kate almost won the lottery.

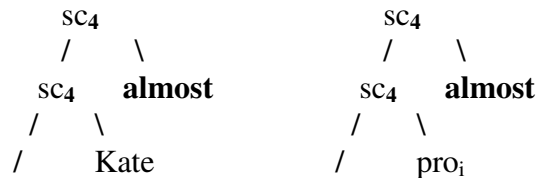
4b. 4th dimension:
[Activity]
Kate almost swam.

4c. 5th dimension:
[Accomplishment]
Kate almost built the house.

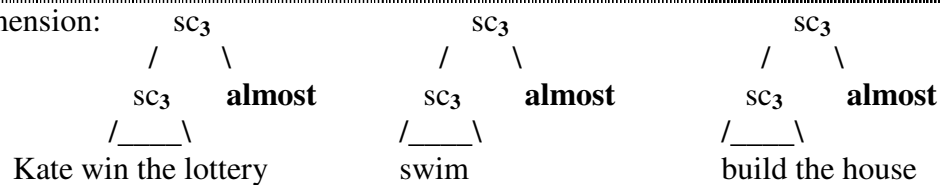
5th dimension:



4th dimension:



3rd dimension:



Simply put, the more internal structure a predicate has, the more adjunction sites it offers for the modification of *almost*. So the direct prediction is that a predicate with a higher order of complexity should be in principle more ways ambiguous than one with a lower order of complexity. In fact, 4 captures all the readings discussed in 1. (I will discuss the various, further, modification possibilities that emerge in the chart above shortly below.)

⁶⁵ For concreteness, I am adjoining the modifying adverb at the various modification sites. My proposal, however, is also compatible with modification taking place by way of adjunction to the *highest* relevant site, and from that point somehow accessing the various modified layers. I put this issue aside now.

First, Agent is the Presentation for the 4th Order of Complexity in verbal projections, yielding activities. Given the Adjunct Projection Principle, *almost* modifies the 4th dimensional small clause under the reading in which *almost* is predicated of ‘the act of swimming’ (Activity, 4th dimensional VP) in 4b, or ‘the act of building’ (Accomplishment, the 5th dimensional VP) in 4c. Since the Achievement in 4a is a 3 dimensional VP and does not have the 4th dimensional small clause to start with, it follows that 4a lacks this reading.

The Presentation for the 5th dimensional verb phrase is Causer, yielding accomplishments. The Accomplishment in 4c is a 5th dimensional VP, but Activity in 4b is a 4th dimensional VP. Again, it is correctly predicted that only the Accomplishment has the reading where *almost* is predicated of the 5th dimensional small clause. That is, only the Accomplishment in 4c has the reading where the caused state (‘the completion of the house’) is in question: it is assumed to have taken place.

The semantic correlate of the 3rd dimension in verb phrases is the ‘change of state’. Indeed, the Achievement (3rd dimensional VP) in 4a has a reading where *almost* modifies the 3rd dimensional small clause: ‘the event of winning did not take place’.

4. 1. 3. More Readings.

In addition to these readings, however, there are more available in 1, which as far as I can see can only be naturally accounted for in a Dimensional Theory in some of its variants. Notice that the structure of the VP in 4 predicts a readings where *almost* is predicated of the 3rd dimensional small clause involved in the Activity (4a) and Accomplishment (4b). I claim that these readings are, in fact, available in 4a and 4b.

Take, for example, an Activity (the 4th dimension VP):

4b. Kate almost swam [4th dimension VP: Activity]

Imagine the following scenario. A three-year old child, Mary, is playing in a pool. She paddles around in the water, trying to swim. At some point, the strokes of her arms and legs in the water look almost like those in ‘swimming’. The following day, you might say to your friend: ‘You know? Mary almost swam yesterday’. I claim that this is the 3rd dimensional, Achievement reading. This reading is quite distinct from the Activity reading. In the Activity reading, Mary is able to swim from the start. What the Activity reading reports is that ‘the activity of Mary’s swimming did not take place’. This reading can be highlighted as follows: ‘Mary almost swam yesterday, but she decided not to’. In contrast, Mary is most likely not able to swim under the scenario in the Achievement reading. This reading focuses on the moment in which ‘Mary’s paddling in the water almost got to the point of being the real ‘swimming’. In other words, what is reported in the Achievement reading is the

moment during which Mary came to be able to swim (even for a moment),⁶⁶ a reading clearly involving ‘Change’, which for me corresponds to the 3rd dimensional Achievement reading.

Likewise, the 5th dimensional VP is three ways ambiguous in 4c: It allows for Accomplishment, Activity, and Achievement readings corresponding to the 5th, 4th, and 3rd dimensional VPs, respectively. The Accomplishment predicate in 4c is repeated here:

4c. Kim almost painted a picture [5th dimension VP: Accomplishment]

Here is a relevant scenario to illustrate the relevant reading: A newly assembled robot, Kim, is messing around with paints. He makes strokes with a brush here and there on a canvas. Then, at some point, the strokes he made on the canvas look almost like ‘a painting’ (of a tree or a portrait of somebody, but not quite). At that moment, you might say: ‘Kim almost painted’. Again, this Achievement (the 3rd dimension) reading is distinct from the readings in which the adverb *almost* modifies Activity (the 4th dimension) or Accomplishment (the 5th dimension).

The question then naturally arises as to whether there is a reading in which *almost* modifies *lower* dimensions than the 3rd (Achievement). It is harder to detect these

⁶⁶ Thanks to J.C. Castillo for this insight. The idea is consistent with McClure’s (1995) argument, alluded to in chapter 2, section 2.4, that Activities are series of Achievements. The attainment of one canonical stroke of swimming is an event describable as an Achievement, and presumably an Activity consist of an organized collection of those.

readings, but close examination reveals that they possibly exist as well. Take, for example, the 5th dimensional (Accomplishment) VP. The following scenarios are relevant:

5a. The 2nd dimensional reading:

Bill is a would-be carpenter. He volunteered to build a house for Tammy. The house that Bill built for Tammy, however, is an eccentric one. It has a toilet in the ceiling, front door on the roof, and a center island on the kitchen wall. Tammy refused to pay Bill. Nobody blamed her: Bill almost built Tammy a house, but he did not quite succeed, ultimately.

[What is denied is the resulting state of the house: the house did not attain a stative property canonically associated with house-building.]

5b. The 1st dimensional reading:

Bill had long planned to build Tammy a house, but he never got enough money to do so. Last year, Bill missed the lottery just by one digit. That's too bad. Bill almost built Tammy a house.

[Bill almost was in the situation where he got to build Tammy a house, but the situation never materialized. Not even an event of attempting to build a house occurred under this scenario].

Notice that the analysis proposed in Pustejovsky simply cannot predict that an Activity is ambiguous in at least two ways, or an Accomplishment is ambiguous at least in three ways. This is so since *P(rocess)* (=Activity) is a primitive event type in his theory, and thus no entailment relationship holds between an Activity and Achievement eventuality. Needless to say, he predicts neither of the readings listed in 5. The problem is not easily patched, for instance adding more primitives to the theory. Unless these are organized in the dimensional ways discussed here, then they will allow too many readings. Simply put, the various ontologies that arise from

conceiving events in linguistic terms do not have the same status: they are implicationally organized. With the proposed inductive nature of the computational system, coupled with the SAAC Hypothesis, these entailment relationships are directly attributed to the architecture of the VP itself in the Dimensional Theory. Within those parameters, the sort of readings discussed here follow quite directly, under natural assumptions about modification.

4. 2. The Frame Adverb ‘*in X-Amount of Time*’.

In this subsection, I discuss the second piece of data that Pustejovsky originally brought to bear on the defense of his proposal. This one also concerns the Aktionsart-sensitivity of adverbials. For reasons of space, I only discuss events now, not states.

Here are the facts. The frame adverb *in X-amount of time* is felicitous in [+telic] sentences, but not in [–telic] sentences. As shown below, Accomplishments (the 5th dimension, [+telic]) and Achievements (the 3rd dimension, [+telic]) co-occur with the adverbial *in X-amount of time*, but this is not the case for Activities (the 4th dimension, [–telic]):

- | | |
|-------------------------------------------------------|-----------------------------------------------------|
| 6a. Sylvia built the house in one hour.
dimension] | [+telic] - [Accomplishment: 5 th |
| 6b. Sylvia won the game in one hour. | [+telic] - [Achievement: 3 rd dimension] |
| 6c. *Sylvia swam in one hour. | [–telic] - [Activity: 4 th dimension] |

4. 2. 1. The Analysis in Pustejovsky (1991).

Pustejovsky assumes that the frame adverbial *in X-amount of time* is a two-place predicate, which measures the temporal distance between two event types. The following is the relevant interpretation:

7. Interpretation of the frame adverb:

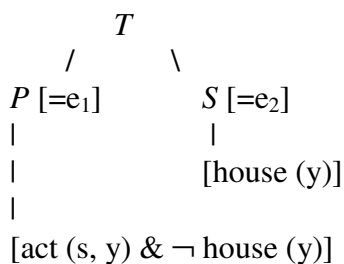
The frame adverb *in X-amount of time* is a two-place predicate. *In* takes two events, $\langle e_1, e_2 \rangle$, as its arguments, where e_1 temporally precedes e_2 . The calculation of the temporal distance between e_1 and e_2 is:

Temporal measure of (time of) e_2 - onset of e_1 .

(Pustejovsky 1991: 62, summarized.)

To see the analysis at work, consider:

8a. Sylvia built the house in one hour:

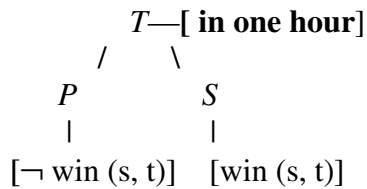


8b. Temporal measure of (time of) S - onset of P = one hour. (Pustejovsky 1991: 62)

As in 8, *in* takes P [act of building the house] as e_1 and S [resulting state: the completion of the house] as e_2 , since P temporally proceeds S . The temporal distance between S and the onset of P is *one hour* in 8.

Since an Accomplishment is comprised of two event types which qualify as two arguments for *in*, it allows the modification by *in one hour*, as in 8. Contrarily, an Activity is an internally simplex *P*. It is not comprised of two event types. Since one of the arguments of *in* is unsaturated, the frame adverb *in one hour* is infelicitous in an Activity (6c). Pustejovsky does not discuss Achievements in terms of the modification by *in X-amount of time*. However, he would have to say that both *P* and *S* qualify as arguments of *in*, in modification by the adverbial *in X-amount time*. The relevant structure is as follows:

9a. Sylvia won the game in one hour.



9b. Temporal measure of (time of) *S* - onset of *P* = one hour.

Notice that in 9a both *P* and *S* must serve as arguments of *in* for the interpretation to come out right. Recall the fact that *P* cannot serve as an argument of *almost* with the Achievement predicate for the intended interpretation in Pustejovsky's account. It is then slightly odd that *P* in the Achievement would selectively qualify as an argument, depending on the adverbials, only for the adverbial *in X-amount of time*, but not for *almost*. As we will see below, however, this assumption is not necessary in the

Dimensional Theory for it can treat the two adverbials uniformly thanks to its rich syntactic structure.

4. 2. 2. The Frame Adverb in the Dimensional Theory.

I assume that the frame adverb *in X-amount of time* is a two-place predicate, following Pustejovsky. I also assume that the frame adverb *in X-amount of time* takes expressions of dimensionality as arguments. Minimally modifying Pustejovsky's proposal, the interpretation of the frame adverb in the Dimensional Theory is as follows:

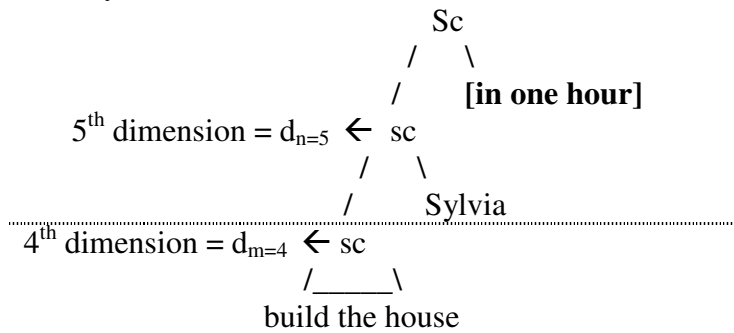
10. interpretation of the frame adverb '*in X-amount of time*' [Dimensional Theory]:

The frame adverb '*in X-amount of time*' is a two-place predicate. '*In*' takes two dimensions, $\langle d_m, d_n \rangle$, as its arguments, where d is taken to be the dimension, and subscripts $_m$ and $_n$ are taken to be *orders* of dimensionality, such that $_m < _n$.

The calculation of the temporal distance between d_m and d_n is:
Temporal measure of (time of) onset of d_n - onset of d_m .

By way of an illustration, let us take up the interpretation of *in one hour* in Accomplishments (the 5th dimension VP). In 11, *in* measures the temporal distance between the expression of the 4th dimensionality 'the act of building the house', and the expression of the 5th dimensionality, 'the completion of the house':

11a. Sylvia built the house in one hour. [5th dimension: Accomplishment]

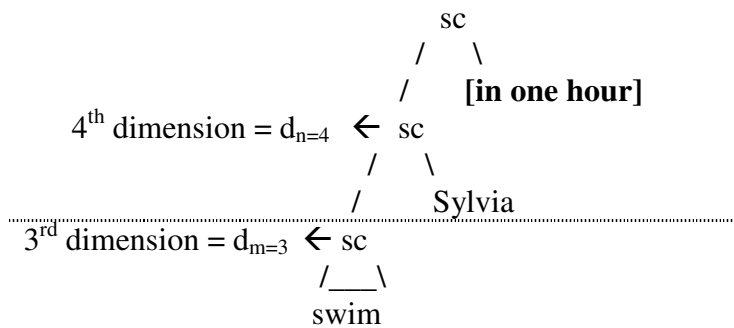


11b. Temporal measure of (time of) onset of d_5 - onset of d_4 = one hour.

In 11, *in* takes d_4 [the act of building the house] as d_m , and d_5 [the completion of the house] as d_n . The temporal distance between the onset of d_5 and the onset of d_4 is ‘one hour’, which is the actual reading in 11.

Next, I take up Activities (the 4th dimension VP). In 12, *in* measures the temporal distance between the expression of the 4th dimensionality (Activity) and that of the 3rd dimensionality (Achievement). The following is the relevant structure and the interpretation:

12a. *Sylvia swam in one hour [4th dimension: Activity]



12b. Temporal measure of (time of) onset of d_4 - onset of d_3 = one hour.

As 12b is stated, nothing should prevent *in* to measure the temporal distance between the onset of the 4th dimension (Activity) and that of the 3rd dimension (Achievement). Thus, syntactically, the frame adverb should be able to modify an Activity in principle. Of course, I must claim that this is indeed the case –a problematic proposition. Nonetheless, what rules out 66, in my view, is the resulting interpretation in the CI component. To see this, let us closely examine the interpretation in 12 –by way of a small detour that will help us clarify some important notions we are operating with.

4. 2. 3. Culminating Events.

I would like to point out a topological property of the Dimensional Theory, at least in the version that I advocate here. If we set aside basic 1st dimensional Spaces based on Themes, as they themselves define the relevant series of verbal spaces, it is easy to observe that even and odd numbered dimensions behave rather differently. The even dimensions set up Spaces, whereas the odd ones ‘culminate’ them, in some sense. Thus, 2nd dimensional Spaces, understood as tight sets of binary relations (see chapter 2, section 2.5.2), clearly constitute a space extension, which ‘culminates’ after it warps into a 3 dimensional coil. The same sort of structuring takes place for what I took in chapter 1 to be spaces of bi-clausal origin (due to light verbs). The 4th

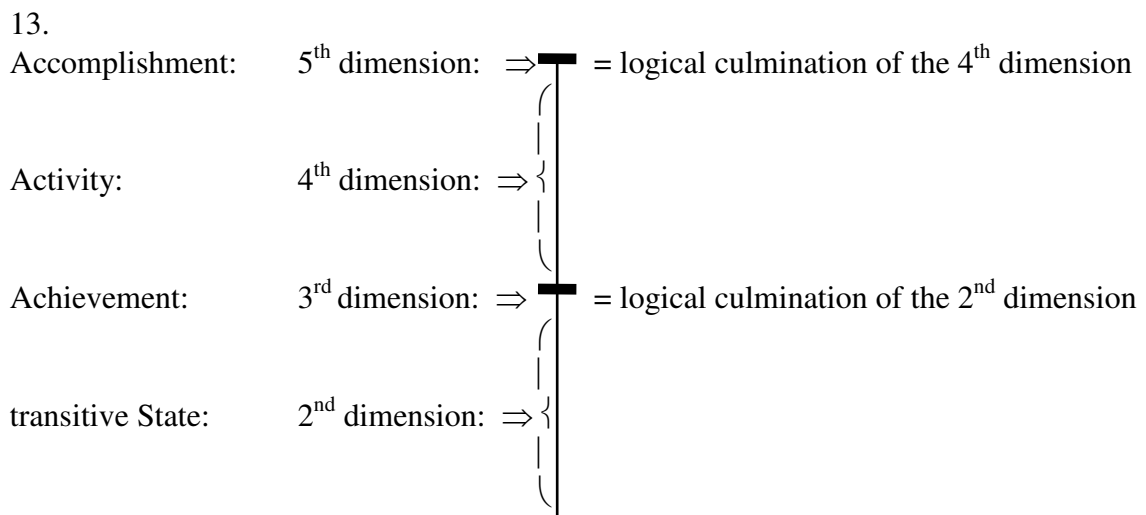
dimensional ‘coil-collection’ is again a space extension, which ‘culminates’ upon its warping into the 5 dimensional ‘phase transition’. In a sense, what’s happening is quite simple: the even dimensions set up extensions of space (hyper-space for the more complex, bi-clausal expressions); in contrast the next, odd, dimensions determine qualitative features in those spaces which, at this very simple level of operation involving operations on the space as a whole (i.e. warps), constitute logical culminations because they establish natural boundaries on the lower-dimensional spaces.

It is then interesting to ask how those purely formal properties of the syntactic support of the relations we are now studying carve up their semantic pathways. We discussed already how (5th dimensional) Accomplishments expresses the ‘logical culmination’ of the preceding act (Pustejovsky 1991). For example, ‘completion of the house’ in *Sylvia built the house* is the logical culmination of ‘the act of building the house’. Moreover, the transitive State (the 2nd dimension) logically culminates as an Achievement (the 3rd dimension), if the semantic notion of ‘logical culmination’ has the effect of giving a telic property to the eventuality a predicate denotes. For example, when Sylvia notices the spot, the spot’s existence is ascertained, which constitutes the end-point of the relevant eventuality. So it seems clear that the trivial syntax/semantics mapping utilizes the topology alluded to in the previous paragraph to express the perceived culmination, in logico/temporal ways, of events.

That is important, because one could have imagined natural language systematically coding *beginning* points for events (or middle points, for that matter). In fact, we know that this possibility exists for various forms of inchoation, for instance in the English auxiliary forms relating to the verbs *start* or *begin*, used in light verb fashion. But no language expresses inchoation *internal to a lexical verb* the way it does telicity, in the Aktionsart scale. I have not seen a non-circular answer to this fact. In the Dimensional Theory, however, it follows. The topological observation above doesn't make sense stated backwards: you cannot warp a given Space into a *simpler* formal object –warping always goes in the direction of further entanglement. That's what warping means: taking a space as a whole and forcing it into a higher, more complex, dimension. In the process, new boundaries emerge.⁶⁷ When all of that is mapped into semantics, open-ended formal spaces are made to correspond to atelic conceptions of events, while the emergent bounds on those spaces are mapped into telic conceptions. There is no room, in this architecture, for 'beginning' points –no way, even, of fixing such points in the formal system.

⁶⁷ I am taking this idea directly from Uriagereka's work (see for instance Uriagereka forthcoming: chapter 7). Warping is a cover term for topological operations that create new, higher dimensional, spaces from lower dimensional ones. This is seen intuitively in the creation of a three-dimensional origami bird from a two dimensional piece of paper, cleverly warped. Certainly one can 'unwarp' the bird back, but this doesn't *create* any new entity –it destroys it. So entanglement in the formal system goes in the direction of emergence, as a logical necessity. This is different from what happens in simple functions, which can be inverted without ontological consequences (e.g. a function from odd numbers to even numbers, yielding their successor, can be inverted to one from even numbers to odd numbers, yielding their predecessor). Importantly for my purposes here, these warping processes create characteristic delimitations to basic spaces: a paper coiled into a bird shape has (regardless of the actual shape) natural spatial boundaries that the uncoiled paper doesn't have. It is precisely those delimitations resulting from the warping process that I suggest map naturally to end-points in semantic terms.

Notice also that logical culmination is naturally perceived as being, essentially, temporarily instantaneous, in terms of notions in the actual world. That is, the time of the completion of the house or that of noticing the spot can be uniquely determined at an instant t . This is schematically represented in 13 (the instantaneous nature of the logical culmination in real time is represented by the bold lines for the 3rd and the 5th dimensions in 13):



I would also like to claim that, interpretation-wise, the assumed instant t that constitutes the ‘logical culmination’ of an n^{th} -dimension is naturally taken by the syntax/semantics mapping to constitute the *onset* of the $n+1^{\text{th}}$ -dimension, even if this is never directly reflected in an inchoative shape for internal aspect.

4. 2. 4. An Impossible and a Possible Interpretation.

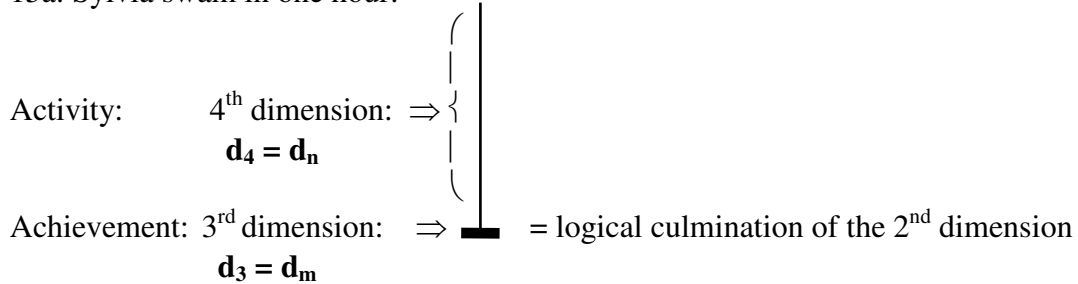
Let us now return to the data in 12 with the Activity predicate, repeated here:

14a. *Sylvia swam in one hour [4th dimension: Activity]

14b. Temporal measure of (time of) onset of d_4 - onset of d_3 = one hour.

14 is schematically represented in 15:

15a. Sylvia swam in one hour:



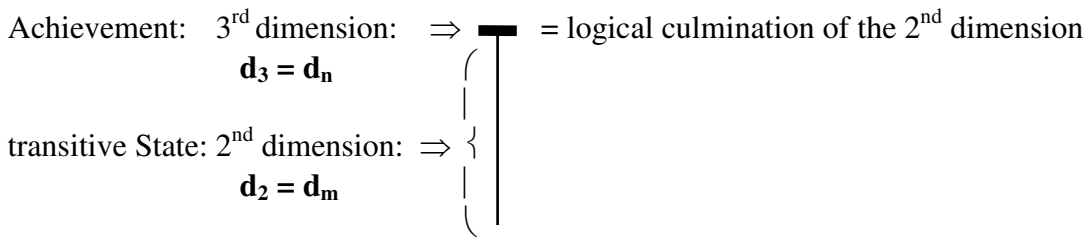
15b. Temporal measure of (time of) onset of d_4 - onset of d_3 = one hour.

As in 15a, *in* measures the temporal distance between the expression of the 4th dimensionality and the 3rd dimensionality of the predicate *swim*. Specifically, the temporal distance measured is between the onset of d_4 , the 4th dimensionality, and the onset of d_3 , the 3rd dimensionality, as in 15b. However, the onset of the Activity (the 4th dimension) coincides with the instantaneous change of state, the Achievement event (the 3rd dimension), as was claimed above. Then there is no temporal distance from the onset of d_4 to the onset of d_3 which can be measured by *in* to start with in

15b. Therefore, the interpretation of *in one hour* in 15b results in an anomaly at the CI component.

Finally, let us take up the interpretation of the frame adverb in an Achievement (the 3rd dimensional VP). In the Dimensional Theory, the frame adverb *in X-amount of time* is interpreted in the uniform fashion for Achievements as well:

16a. Sylvia won the game in one hour [Achievement]



16b. Temporal measure of (time of) onset of \mathbf{d}_3 - onset of \mathbf{d}_2 = one hour.

As in 16b, the temporal distance measured by *in* is between the onset of the expression of the 2nd dimensionality (transitive States) and that of the expression of the 3rd dimensionality (Achievements). As schematically shown in 16b, this does not result in any anomaly, since the onset of the 2nd dimension does not coincide with that of the 3rd dimension.

I should perhaps add that the conditions I have added to the theory concerning logical culmination need to be explored further, quite aside from the fact that they work. (This is especially so in the case of what I take to be interpreted as the onset of

an event, which is not coded syntactically.) This task, however, is beyond the scope of the present dissertation, and I must leave it for future research.

4. 3. Summary and Conclusions.

This chapter has served, first of all, to introduce a new sort of evidence to test the Dimensional Theory when applied to VPs in the SAAC fashion: verbal modification. We owe it to Pustejovsky that he found and discussed new and interesting possibilities for modification concerning aspectually complex verbs. Moreover, it is useful that he provided us with explicit mechanisms, within a standard lexical semantics model, to code the relevant readings. That said, we have seen how the *sort* of mechanisms he introduced are, first of all, ontologically suspect, at least from a minimalist perspective. Plainly, what are these notions? Semantic primitives? If so, how do they organize and why that way? And more importantly for us here: How do they map into the syntax and why that way? I know of no simple answers to these basic questions. Moreover, I have shown something that is not customarily explored in lexical-semantics studies: the relevant notions, if taken at face value, plainly overgenerate.

I want to emphasize this point because it is at the core of a very important debate that I alluded to at the very onset of this thesis: whether the rules for sub-lexical units should or should not be syntactic. One cannot have it both ways: if one wants sub-lexical units to act as better studied syntactic units, then one should simply use more

or less standard syntactic tools (how standard being a debatable matter) and more importantly: one should let those tools apply. Blindly. Anything can be described if we give ourselves sufficiently descriptive power, trivially. The useful thing is to limit the descriptive power (on learnability, biological, logical, or any other grounds) and then show that with that, on the one hand (a) we obtain the relevant description being faithful to observation, and on the other (b) we don't, given the appropriate tool, wildly predict all sorts of new creatures too. In my view this is often forgotten when it comes to lexical semantic notions, for which there are postulated all sorts of new entities (with a more or less intuitive appeal: sub-events, time lines, end-points, and so on, all of which are customarily assumed to have some primitive status) and often tacitly assumed rules (e.g. the 'end point' manages to *follow*, or *fall on*, some 'time line' for relevant events). The question is simple, if these entities and relations are to be taken seriously: can one get new combinatorial possibilities? Moreover: Are they observable in language?

Here I have tried to show that, at least with regards to modification by the interesting class of adverbs that Pustejovsky studied, on the one hand *more* modifications than his system predicts emerge; but on the other, they are also *of a more limited sort* than his kind of ontology would lead us to expect. Naturally, given the general tenets of the theory I have defended, I have tried to argue that the dimensional layers I proposed for the VP are ideal hosts for the relevant modifications. I believe this is a rather powerful descriptive argument for my take on things, for it is not just the case that more readings are available, but furthermore that

they organize in a peculiar, dimensional way. It won't be enough to multiply relevant entities to allow for more fine-grained distinctions: they will have to be hierarchically organized in ways that correlate with my SAAC hypothesis. I seriously believe that if my empirical analysis holds, any theoretical alternative to what I have proposed will have to be a notational variant, including hierarchical dimensions somewhere in the descriptive apparatus.

Once again, I don't want to hide the work that lies ahead –or the dust that has been hidden under the rug. The part of *modifying into* the dimensional layers is straightforward, but precisely how modification obtains is not. Note, in particular, that the logic of my proposal leads me to suspect that modification can happen long distance: from a modifier that is associated in the surface to some dimension D, but somehow manages to modify *into* D-n (for *n* any internal dimension). This, of course, is not a trivial matter. That said, I find it hopeful that Chomsky has recently (2005) treated adjuncts as somehow occupying a 'different dimension', an idea that Lasnik and Uriagereka (2005) developed as, in essence, simply 'being there' in a given derivational cycle. It is perhaps the case that those adjuncts that just 'are there' (with no standard syntactic relation of the phrasal sort, according to Lasnik and Uriagereka) somehow manage to modify into the dimension they 'sit in', and also others within its 'scope'. But in any case this is a matter that clearly awaits further research.

As awaits future investigation precisely what it means to have events ‘start’ and ‘finish’, which I have made much use of in this chapter. Again, the terminus of such events is not an unnatural thing to have for the sort of architecture I explore here: the mere syntax itself yields that, if it is of the ‘swinging’ sort I have proposed here, with given spaces finding a characteristic boundary to them at the next dimension (see chapter 6 and 7 for more on this). However, the beginning point of the events doesn’t come out as naturally –or naturally at all. The good news is that languages don’t code, in terms of Aktionsart, beginning points –they do end points instead. This is, I take it, a virtue of the present system, where semantics is trivially mapped from syntax, and where syntax only gives us natural end-points. However, we need, indirectly at least (for instance when measuring durations) to also make use of beginning points. In fact, as we see in the next chapter, languages certainly can express *inchoation*, which in some sense is about starting out events, as much as they can express *causation*. And of course the question is why all of a sudden the relevant notions become available. I have essentially stipulated their presence, with the sort of axiomatic mapping (in chapter 2) that I accuse less principled research to use. Unfortunately at this point I will not be able to resolve this matter.

Chapter 5: Amalgamating Derivational Verb Morphemes.

In this chapter, I discuss contrasting processes for amalgamating derivational morphemes into a lexical verb, together with concomitant syntactic mechanisms. Specifically, I extend what Lasnik (1999) proposed for inflectional morphology to those aspects of derivational morphology that bear on verbal dimensionality, and propose that English employs feature-checking of an already assembled lexical verb for its derivational morphemes, whereas Japanese resorts to assembling pieces of derivational morphemes into a lexical verb through an affixal process in the PF component. These two strategies for ‘word-formation’, or the amalgamation of derivational verb morphemes into a lexical ‘word’, have far-reaching ramifications both in terms of syntax and semantics. When cast in the Dimensional Theory, where not only each order of dimensional complexities is syntactically real, but also woven into a tight entailment relationship, otherwise puzzling pieces of data from English and Japanese (especially when both languages are assumed to have the same conceptual units) naturally fit together into one coherent picture in the overall architecture of lexical verb structures proposed here, and in a simple fashion.

First, I lay out my proposal pertaining to amalgamation of derivational morphemes for lexical verbs in English and Japanese. Then I back it up with syntactic evidence based on VP ellipsis data (section 5.1). Thirdly, I present two classes of semantic evidence in English and Japanese to support the proposal: (a) lexical integrity involving temporal modifiers and subevent entailment patterns in lexical causatives, and; (b) resultative-state interpretations in inchoative perfects. These pieces of data

together argue for multi-constituency within lexical causatives, including a ‘bi-clausality’ that is directly relevant to my concerns here –as well as for a rich, articulated, structure for lexical inchoatives (sections 5.2 and 5.3). A brief conclusion closes the chapter.

5.1. Proposal: Amalgamating Derivational Verb Morphemes.

Let me start by presenting my proposal concerning two strategies for amalgamating derivational verb morphemes, and the concomitant syntactic mechanism employed in the process (section 5.1.1). Next I will introduce syntactic evidence from VP ellipsis to support this proposal (section 5.1.2.). Finally I’ll discuss the processes involved in the VP ellipsis operations within this proposal: I will be arguing for a special provision for the characteristic identity requirement pertaining to VP ellipsis, proposing that this is derivable from the architecture of lexical verb. In effect, I will show that the identification process is governed by economy considerations expressed in terms of the traditional ‘recoverability of deletion’.

5.1.1. Feature-Checking versus PF Affixation.

Lasnik (1999) proposes two strategies for verb head amalgamation involved in inflectional morphology. One is a feature-checking strategy in narrow syntax with the verb amalgam taken out of the lexicon already inflected for Case, tense, etc. I call this strategy [+Featural]. The other is affixal. In the [Affixal] strategy, a lexical verb

head is introduced ‘bare’ into the syntax, then assembled with independent inflectional morphemes at the PF component to meet the morphological needs of an adjacency requirement.⁶⁸ English verb heads employ the [Affixal] strategy in the PF component, whereas French (in Lasnik’s study) opts for the [+Featural] one in narrow syntax. This is, again, for standard *inflectional* verb morphemes.

If indeed these are the options permitted by C_{hi} , then we might expect to see this contrast in *derivational* morphology as well.⁶⁹ I propose that in the derivational morphology, Japanese amalgamates derivational morphemes into a lexical verb through the [Affixal] strategy in the PF component, whereas English opts for the [+Featural] strategy with a lexical verb taken from the lexicon already with its derivational morphemes attached, checking its features in lexical structures.⁷⁰

⁶⁸ [Affixal] does not mean that some sort of feature is involved. This is, rather, a PF requirement to meet morphological needs. Lasnik defines it as follows:

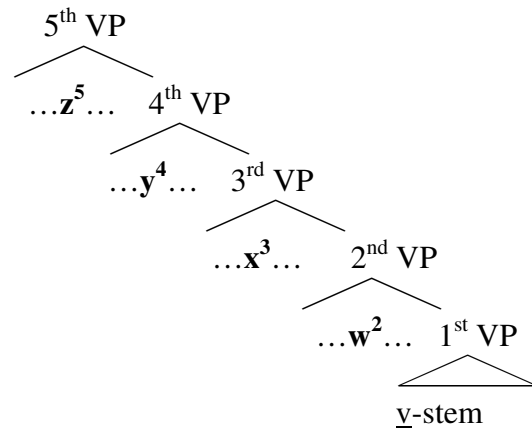
- (i) Affixal [elements] must merge with a[n appropriate term], a PF process (distinct from head movement) demanding adjacency. (Lasnik 1999: 105, his (28))

⁶⁹ Needless to say, this takes us right back to familiar debates between lexicalists and generative semanticists (see Uriagereka forthcoming: chapter 2 for a summary of the relevant points). What I say here need not apply to all instances of derivational morphology; strictly it only does to those that involve dimensional cuts, in the sense explored in this thesis. That said, the issues of ‘productivity’, ‘transparency’ and ‘systematicity’ for each kind of morphology remain (plainly, both types of morphology do not fare equally with regards to these properties). Uriagereka discusses this matter at length in the last chapter of the work cited, where he also has a proposal to address this issue. I do not have anything new to say in this thesis about the whole discussion.

⁷⁰ Keep in mind that for me ‘(narrow) syntax’ crucially includes the lexical verb structure that I propose in this thesis.

Schematically, this is depicted for the most complex lexical VP, the causative 5th VP, as in 1. The same line of reasoning holds for a VP with any order of dimensional complexity:

1. Japanese lexical causatives (=5th VP):



The bold-faced elements in 1 represent pieces of derivational verb morphemes.⁷¹ The derivational morphemes are, in my view, spell-outs of dimensional complexities.⁷²

The superscripts stand for the specific order of the dimensional complexities that the elements are first merged as into the syntax.⁷³

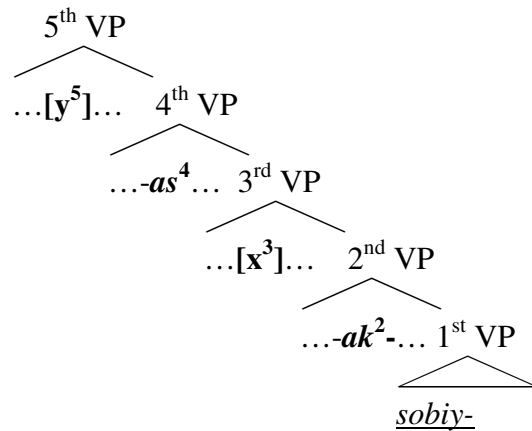
⁷¹ Some of the derivational verb morphemes in 1 are not present, depending on which verb stem is taken out from the lexicon. The tree diagram in 1 illustrates the proposal in the most general fashion.

⁷² See section 5.1.3, on the VP ellipsis for more discussions on this point. See also chapter 6 for the substantial contribution they bring into semantic interpretation because of this.

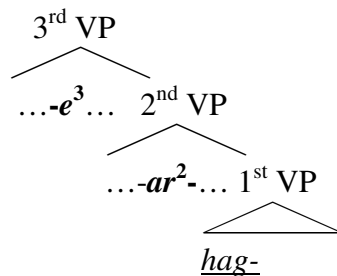
⁷³ See chapter 6 on specific structural positions of both causative and inchoative derivational morphemes in Japanese.

I illustrate things with the causative verb *sobiy-ak-as* (tower)⁷⁴ in 2a, and with an inchoative verb *hag-ar-e* (come off) in 2b:⁷⁵

2a. Japanese causative verb, *sobiy-ak-as* (‘tower’; = 5th VP):



2b. Japanese inchoative verb, *hag-ar-e* (‘peel off’; = 3rd VP):



Here, for example, in 2a, there is no derivational verb morpheme for the y^5 or x^3 in those orders of dimensional VPs. The derivational morphemes $-ak^2-$ and $-as^4$ each

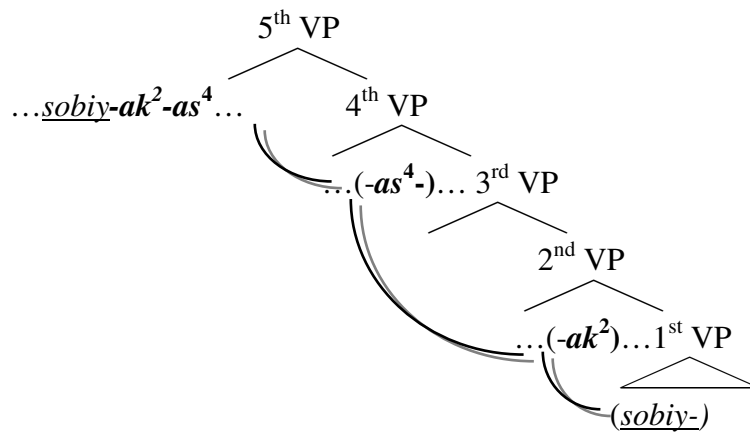
⁷⁴ This verb is used with the sense of ‘to come to tower over’.

⁷⁵ The verbs commonly cited –for example in dictionaries– are: *sobiy-ak-as-u* and *hag-ar-e-ru*. This is so because, roughly, Japanese requires a CV sequence. As such, the last bold-faced letters, *-u* and *-ru*, are default vowels, interpreted as non-past. So they are irrelevant for the purpose here. See fn. 89, chapter 6.

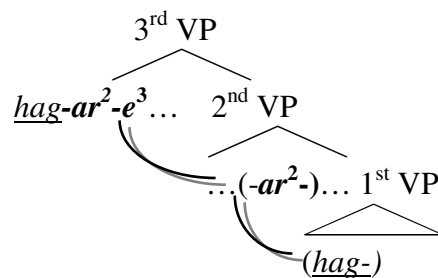
occupy the 2nd and 4th dimensional VPs, where they are first merged into syntax.⁷⁶

After the PF affixal amalgamation of those derivational morphemes in 2, they end up as in 3a and 3b, to be pronounced as a causative lexical verb *sobiy-ak-as* and an inchoative one *hag-ar-e*:

3a. Japanese causative verb, *sobiy-ak-as* ('tower' = 5th VP):



3b. Japanese inchoative verb, *hag-ar-e* ('peel off'; = 3rd VP):

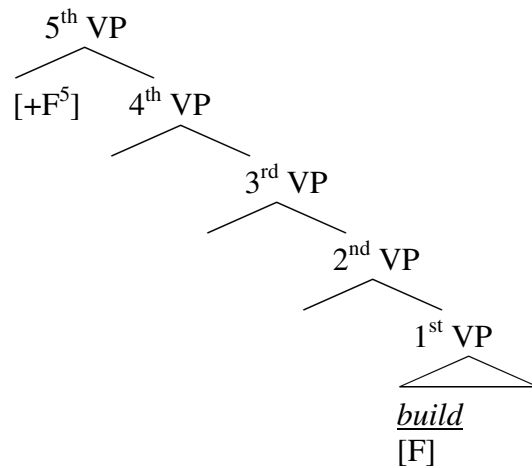


⁷⁶ I stress that derivational morphemes are nothing but a spell-out of specific dimensional orders. That said, some mechanism of argument-predicate co-indexation of the sort discussed in Stowell (1982) or Baker (2003) has to be at work here for the coding of the order of dimensionalities onto the morphemes. I owe this suggestion to Paul Pietroski.

As depicted in 3, the derivational verb morphemes are put together into a lexical verb at PF in Japanese, in order to meet the morphological requirement of adjacency.⁷⁷

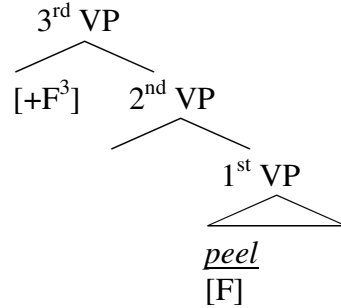
In contrast, an English verb is introduced into syntax as a fully-assembled lexical unit, as in 4:

4a. English causative verb; *build* (= 5th VP):



⁷⁷ In 3, morphological adjacency is fulfilled by ‘hopping up’ the structurally lower derivational morpheme to the immediately upper one. This is for ease of presentation. Morphology may actually opt for hopping morphemes down onto the verb stem. (In fact derivational verb morphemes must hop down for the predication story to go through in section 5.2 in Japanese.) However, if all syntactic items within a VP are to evacuate the VP, except for the derivational morphemes, then the relevant hopping could be up, down, or involve no displacement at all (see footnote 108 in section 5.2). The tacit assumption I adopt here is that the morphological component amalgamates morphemes in the simplest fashion (up, down, or in any other way). Crucially, however, there should be no skipping over a morpheme, or scrambling relevant morphemes to attain morphological results. This is consistent with the idea, discussed in Uriagereka (forthcoming: chapter 6) that this sort of morphology involves Markovian processes of some sort.

8b. English inchoative verb, *peel* (= 3rd VP):



These verbs are taken out of the lexicon fully assembled with derivational morphemes, as a ‘word’, and then they check off their verb feature against the matching feature at the relevant order of dimension in narrow syntax, in English.⁷⁸

Now that I have presented the core of my proposal in this chapter, I turn to syntactic evidence based on VP ellipsis to motivate its syntactic foundations.

5.1.2. Syntactic Evidence: VP Ellipsis.

The evidence that Lasnik (1999) presents to support the two strategies he explores for the inflectional morphology of verb heads centers around VP ellipsis. Assuming

⁷⁸ I assume that *build* in 4a in English checks its derivational feature only at the topmost node of the VP, the 5th order of the dimensional VP in 4a, presumably to check an event-feature. I need to assume this for section 5.3 to make sense. In this thesis I won’t explore different varieties of derivational causativizers in English (such as *-ize*, *-ify*, *-en*, etc.), or inchoativizers either. Thus there is no way that I can make any claim about the specific orders of dimensional complexities that might be associated with derivational features in English verbs, other than the topmost event-feature –which I assume to be a necessity for any VP. I leave this vast unexplored area for future research.

'parallelism' as a prerequisite condition for VP ellipsis, the deletion process in 5a is possible only if a lexical verb is introduced into syntax bare, as in 5b:

5a. Mary slept, and Bill will, too.

5b. Mary [_T -ed] [_V sleep], and Bill [_T will] [_V sleep], too.

5c. Mary [_T -ed] [_V sleep], and Bill [_T will] [_V ~~sleep], too.~~

5d. *Mary [_T [+Feature]] [_V slept], and Bill [_T will] [_V sleep], too.

[Lasnik, 1999: page 110.]

In 5b, the verb *sleep* is taken from the lexicon bare, and merged into the structure. As the underlined verb to be elided and the one in the antecedent VP are identified in 5b, the deletion goes through in 5c. In contrast, in 5d *sleep* is introduced into syntax fully inflected. As a consequence the identity requirement cannot be met here and no deletion process can apply in 5d. This is obviously contrary to the availability of the construction, as 5a reflects. Conclusion: English must be employing a strategy in which a bare verb is used, as in 5b –as opposed to the fully inflected possibility. The bare verb is finally put together with its various inflectional morphemes (tense, agreement, etc.) in the PF component.⁷⁹

⁷⁹ Not all languages behave this way, as Lasnik points out. If a language deploys the strategy in 5d it will not present VP ellipsis of the liberal sort witnessed in English, allowing it only in conditions of the strictest identity between the antecedent and the elided material.

If Japanese, as I have alluded to, utilizes bare verbs and subsequent PF affix amalgamation in instances leading to the various layers of Aktionsart discussed in this thesis, then we directly predict that VP ellipses involving the relevant derivational morphemes will be acceptable, without involving the strictest forms of identity (simply because the looser form of identity that the affixation strategy permits, as in 5c, will be a possibility in these instances too). If, on the other hand, as I also mentioned English employs feature-checking morphemes in the narrow syntax for comparable domains, then corresponding VP ellipses should be ill-formed in this language. Interestingly, this rather striking prediction is borne out:

[SCENARIO: Hiroshi is a professional dry cleaner. He needs to shrink garments by steaming them]:

6a. Hiroshi-ga syatsu-o tizim-e-ta. Nekutai-mo soo nat-ta
 -nom shirt-acc shrink-Caus.-past tie-also so become-past

(Lit.: Hiroshi shrank the shirt. The tie became so (=shrank), too.)

6b. Hiroshi-ga syatu-no sode-o ni-zikan-de ni-senti tizim-e-ta-ga,
 -nom shirt-gen sleeves-acc two-hour-in two-cm shrink-Caus.-past-but
 tee-syatu-no sode-wa sanzyup-pun-de soo nat-ta.

T-shirt-gen sleeves-top thirty-minute-in so become-past

(Lit.: Hiroshi shrank the sleeves of the dress shirt by 2 cm in 2 hours, but the sleeves of the T-shirt became so (=shrank) by 2 cm in 30 minutes.)

[SCENARIO: Hiroshi has an interest in melting various things, for his science project]:

7a. Hiroshi-ga gurasu-o tok-asi-ta. purasutikku/kappu-mo soo nat-ta
-nom glass-acc melt-Caus.-past plastic/cup-also so become-past
(Lit.: Hiroshi melted the glass. The plastic/cup became so (=melted), too.)

7b. Hiroshi-ga gurasu-o sanzyup-pun-de kanzen-ni tok-asi-ta-ga,
-nom glass-acc thirty-minutes-in complete-adv. melt-Caus.-past-but
purasutikku/kappu-wa ni-zikan-de hanbun-dake soo nat-ta
plastic/cup-top two-hour-in half-only so become-past
(Lit.: Hiroshi melted the glass completely in 30 minutes, but the plastic/cup became so (=melted) only ½ in 2 hours.)

[SCENARIO: Hiroshi is trying to open windows that are stuck. The double-door windows happen to open in the middle, their right half and their left half.]

8a. Hiroshi-ga ima-no mado-o ak-e-ta.
-nom living.room-gen window-acc open-Caus.-past
Daidokoro-no mado-mo soo nat-ta.
kitchen-gen window-also so become-past
(Lit.: Hiroshi opened the window in the living room. The window in the kitchen became so (=opened), too.)

In the examples in 6 to 8, a causative verb is used in the first sentence of the Japanese VP ellipses.⁸⁰ The VP with the light verb *became so* in the VP ellipsis construction represents the inchoative part of the antecedent causative verb. That is, *become so* stands for an inchoative eventuality denoted by ‘shrank’ in 6a and ‘melt’ in 7a. Notice, in addition, that the elided VP can also indicate the inchoative eventuality with the modifiers: ‘shrank by 6 cm’ in 6b, and ‘melt completely’ in 7b. These examples suggest a richer structure within the lexical causative verb than initially meets the eye.

The well-formedness of the VP ellipsis involving derivational morphology in Japanese directly supports the claim that bits and pieces of derivational morphemes for a lexical verb are introduced into syntax bare, to be subsequently amalgamated into a ‘word’. This parallels what we saw earlier for the inflectional verb morphology in Lasnik’s examples.

Needless to say, English equivalents of the examples 6-8 are deviant:

9a. Sam shrank the shirt. So the shirt shrank. (?)The tie did, too.

9b. Sam shrank the shirt. ??? The tie did, too.

⁸⁰ In section 5.1.2.1, I argue that VP ellipses of the forms *soo sur/nar* (do/become so) in Japanese involve syntactic processes, exactly on a par with *do so* in English.

10a. Sam shrank the sleeves of the shirt by two inches in two hours.

So the sleeves of the shirt shrank by two inches.

(?)But the sleeves of the T-shirt did so in thirty minutes.

10b. Sam shrank the shirt.

?*But the sleeves of the T-shirt did so in thirty minutes.

11a. Sam melted the glass. So the glass melted. (?)The plastic/cup did, too.

11b. Sam melted the glass. ?* The plastic/cup did, too.

12a. Sam melted the glass completely. So the glass melted completely.

(?)But the plastic/cup did so only on its right half.

12b. Sam melted the glass completely.

?* But the plastic/cup did so only on its right half.

As shown in 9 through 12, the light verb in the elided VP cannot refer back to the inchoative eventuality within the causative event in the antecedent clause.⁸¹ This, again, naturally falls out if we assume that in English a lexical causative is introduced in the derivation as a fully assembled word.

⁸¹ Judgments vary among natives. I found out that about 20% of the speakers consulted consider the (b) examples in 9-12 acceptable, ranging from 'fully acceptable' to 'marginal'. For those speakers as well, though, the contrast between the (a) and (b) examples still holds. I thus conclude that the (b) examples in 5-8 are deviant in English, contrary to what is reported in Lakoff (1970).

The following examples in Japanese show the same point as well.⁸²

13a. Oyu-ga wa-i-ta. Hiroshi-ga soo si-ta.
hot.water-nom boil-Inch.-past -nom so do-past

(Lit.: The water boiled. Hiroshi did so (=boiled it).)

13b. *The water boiled. Hiroshi did so.

As in 13a, the elided VP refers to the causative eventuality with the antecedent inchoative eventuality as its subevent. The more complex causative eventuality can find the less complex inchoative one within itself, and match it with that denoted by the antecedent inchoative VP. This class of VP ellipsis is unanimously out in English, as in 13b. I return to the precise derivations of the examples in 6-13 below. My purpose here is to motivate the featural versus affixal nature of lexical causative verbs in English and Japanese –and of lexical verbs in general in these languages by parity of reasoning.

To the extent that VP ellipsis operates on syntactic constituency, the data above motivate rich syntactic structures for lexical causative verbs in Japanese, by demonstrating that the sub-structure within this complex structure is syntactically maneuverable. The structure interpreted as the inchoative eventuality in the CI component is of the 3rd order of dimensional VP. The causative verb has the complexity of the 5th dimensional VP. So this argues for the constituency of what is

⁸² I owe this example to Paul Pietroski. It popped out in the course of discussion on the canonicity of verbs.

to be interpreted as the inchoative eventuality at the CI component, the 3rd VP, within the whole causative eventuality, the 5th VP.

I now turn to the stative eventuality, or 2nd order of complexities, within a causative verb, of the 5th order of complexity. The following examples strongly suggest that a contrast analogous to the one we saw in examples 6-13 for the inchoative eventualities in a causative verb in English vs. Japanese holds for the stative eventualities too:⁸³

14a. Konpuutaa-no modemu-ga tukue-no ue-ni ar-u
computer-gen modem-nom desk-gen top-at be-pres.
Hiroshi-ga soo si-ta
-nom so so-past

(Lit.: The computer's modem is on the desk. Hiroshi did so (=caused it to be on the desk).)

14b. The computer's modem is on the desk. *Hiroshi did so.

15a. Genkan-ga kirei-da. Hiroshi-ga soo si-ta
entrance-nom clean-affirm.pres. -nom so do-past

(Lit.: The entrance is clean. Hiroshi did so (=caused it to be clean).)

15b. The entrance is clean. *Hiroshi did so.

⁸³ I use 'ϕ' to represent a phonologically null morpheme in 16a.

16a. Urakido-ga ni-senti ai- ϕ -te-ir-u. Hiroshi-ga soo si-ta.
 back.door-nom two-cm open-Inch.-TE-be-pres -nom so do-past
 (Lit.: The backdoor is open by 2cm. Hiroshi did so (=caused it to be open by
 2cm).)

16b. The backdoor is open by 2cm. *Hiroshi did so.

17a. Koodo-ga dengen-kara hazu-re-te-ir-u.
 cord-nom outlet-from remove-Inch.-TE-be-pres.
 Hiroshi-ga soo si-ta/si-te-ir-u
 -nom so do-past/do-TE-be-pres.

(Lit.: The electric cord is removed from (=off) the outlet.

Hiroshi did so(=caused it to be removed from the outlet).)

17b. The electric cord is removed from/off the outlet. *Hiroshi did so.

As the examples in 14 to 17 show, in Japanese the elided VP is able to refer back to the state mentioned in the antecedent clause, whereas the corresponding English sentences are ill-formed. These examples again support an analysis arguing that at some point in the derivation of a verb the constituent denoting stativity in a causative verb is introduced into syntax in bare form –in a language like Japanese– and is subsequently integrated into a causative lexical ‘word’. Contrarily, an English lexical causative verb starts its syntactic computation already fully assembled with derivational morphemes denoting states, inchoatives, etc., as one lexical ‘word’. As such, identity cannot be established with the inchoative or stative derivational

morphemes in English causatives in 6 through 17, rendering relevant VP ellipses ill-formed.

In this section I have motivated the constituency of complex sub-eventualities within a lexical causative through VP ellipsis, based on the [Affixal] versus [+Featural] approaches discussed at the outset. My analysis again suggests that each order of dimensional complexity in verbal structure is syntactically real in my proposal.⁸⁴ I turn to specific derivations for the examples of VP ellipsis in 6-17 in subsection 5.1.3.

5.1.2.1. Japanese VP Ellipsis *soo-suru/soo-naru* as ‘Surface Anaphora’.

In previous sections I have argued for the PF merger of derivational verbal morphemes in Japanese, based on VP ellipsis involving *soo-suru/soo-naru* (basically, do so/become so). Naturally, the question arises as to whether these VP pro-forms are indeed the result of syntactic operations, a matter I would like to elucidate in this

⁸⁴ Evidently, an issue that emerges is what the status of the relevant dimensional cuts is in English. Note that, as discussed throughout, I want these dimensions to be real enough to count for entailment purposes, at least. Yet, we have just seen that in English the structures are not transparent enough to anchor a syntactic process like ellipsis. This forces us to invoke a parameter of some sort, which in turn raises a host of familiar learnability considerations. Surely this must have something to do with whether the appropriate representation of the dimensional morphemes is affixal or featural, but that is another way of saying that there is something in need of further explanation (as is more generally the case, incidentally, for inflectional morphological differences patent across languages). I will not pursue the matter here beyond what I will be saying in section 5.2 and 5.3 below when I explore semantic differences between the two languages in related domains. I do want to submit, however, that the logic of the approach actually forces the Japanese setting to be, in some sense, what UG defaults to, if we are to use the appropriate structuring to calculate entailments.

subsection. Hankamer and Sag (1976) classify VP anaphora into two types: surface and deep. The former involves syntactic processes, unlike the latter. Based on their work, I present evidence suggesting that the VP pro-forms *soo-suru/soo-naru* (do so/become so) constitute instances of syntactic, surface anaphora. The diagnostic I use is the availability of pragmatic control.

According to Hankamer and Sag, surface anaphora does not allow pragmatic control (18a), whereas deep anaphora does (18b):

[Scenario: Hankamer attempts to stuff a 9-inch ball through a 6-inch hoop;]

18a. Sag: # It's not clear that you'll be able to.

18b. Sag: It's not clear that you'll be able to do it.

(Hankamer and Sag 1976; 405. Their (3) and (4).)

The examples in 18 indicate that the pro-form *do so* in English corresponds to (syntactic) surface anaphora; in contrast, *do it* expresses (pragmatic) deep anaphora. That is, *do so* requires an overt syntactic constituent as its antecedent, absent in 18, whereas *do it* can take a pragmatically salient factor as antecedent. Applying this diagnostic directly to Japanese, we see that the VP pro-forms *soo-suru/soo-naru* (do so/become so) involve syntactic surface anaphora, on a par with *do so* in English.

For readers' convenience, I repeat the first class of constructions with the VP pro-forms, which have been presented in support of the PF merger of the dimensional verbal morphemes in Japanese in the previous sections:

19. Hiroshi-ga garasu-o tok-asi-ta.
 -nom glass-acc melt-Caus.-past
Prasutikku-mo soo nat-ta
plastic-focus so become-past

(Lit.: Hiroshi melted the glass. The plastic became so, too.)

In 19, the 3rd VP constituent within the larger causative 5th VP *tok-as* (melt-Caus.) serves as antecedent for the inchoative 3rd VP with the VP pro-form *soo saru* (become so). With this in mind, now consider the following example:

[Scenario: An undercover documentary film shown at police national headquarters.

On the screen, suspected criminal Hiroshi melts a piece of glass as a test for his mass destruction plan. Since the glass is connected to some explosive material, an explosion ensues. Next Hiroshi sets fire to a piece of plastic to melt it, which is connected to masses of explosive material, enough to blow up a huge populated area.

The film director stops the film, and says:]

Now consider the second class of the constructions for the VP pro-forms presented in the previous sections:

21. Purasutikku-ga tok-e-ta. Hiroshi-ga soo-si-ta.
plastic-nom melt-Inch.-past -nom so-do-past
(Lit.: Plastic melted. Hiroshi did so.)

This time, the overt inchoative 3rd VP *tok-eru* (melt-Inch.) serves as antecedent for the 3rd VP layer of the causative 5th VP, and is replaced by the pro-form *soo suru* (do so) in 21 (for details, see Section 5.1.3.2.) As shown below, the VP pro-form *soo-suru* (do so) in this environment also resists pragmatic control. This is illustrated in 22:

[Scenario: An undercover documentary film shown at police national headquarters. On the screen, suspected criminal Hiroshi melts a stolen metal piece of art. The next scene displays the art piece melting into a pool of metal. The director stops the film, and says:]

- 22a. #Hiroshi-ga soo-si-masi-ta.
-nom so-do-polite-past
(Lit.: Hiroshi did so.)

22b. Hiroshi-ga bityutsu-hin-o tokasi-masi-ta.
 -nom art-item-acc melt-Caus.-past.

(Lit.: Hiroshi melted the piece of art.)

22c. Go-ran-no yooni bityutu-hin-wa tok-masi-ta.
 honorific.-see-particle. like art-item-top melt-Inch.-polite.-past
Hiroshi-ga soo-si-masi-ta.
 -nom so-do-polite-past

(Lit.: As you saw it, the piece of art melted. Hiroshi did so.)

Again, the examples in 22 indicate that the VP pro-form *soo suru* (do so) (hence also in 21) involves surface anaphora, for it disallows pragmatic control (22a), and instead requires an overt antecedent (22c) to be well-formed.

In this subsection I have presented evidence illustrating that the VP pro-forms *soo naru* (become so) and *soo suru* (do so) disallow pragmatic control and require overt syntactic antecedents in Japanese, in exactly the same constructions presented in support of the PF merger of the derivational verbal morphemes in the previous subsections. Thus I conclude that the constructions with the VP pro-forms *soo naru* and *soo suru* indeed involve surface anaphora, the result of syntactic operations.

5.1.2.2. Lexical Ambiguity: Are Japanese Inchoatives ‘States’ or ‘Events’?

I would like to clarify, also, whether inchoatives in Japanese are verbal, or are they are, instead, adjectives or stative predicates in disguise, this possibly being responsible for their surprising behavior qua ellipsis.⁸⁵ If they are indeed adjectives, not true verbal expressions, one ought to be able to substitute them by the adjectival pro-form *soo naru* (become so), as is the case in English as well:

23. Bill kicked the door half open. The window became so too.

In 23, *so* is clearly a pro-form for the overt adjective *half open* (it is obviously not substituting, say, the inchoative, 3rd dimensional sub-constituent of the 4th dimensional verb *kick*, or any such structural slice). In what follows I claim that lexical inchoative verbs in Japanese are indeed eventive inchoatives, not adjective or state-like predicates. I give three arguments to this effect: interpretation of non-past morphemes; ‘sequence of time’ phenomena; and a line of research that claims the predominance of lexical inchoative verbs in Japanese, as opposed to lexical stative verbs.

⁸⁵ I thank Norbert Hornstein for raising this possibility.

5.1.2.2.1. Interpretation of Non-Past Morphemes in Japanese Inchoatives.

It is well-known that in Japanese non-past morphemes describe the present situation with stative predicates, whereas they express a future eventuality, instead, with eventive predicates:⁸⁶

24. Hiroshi-wa isog-asi-i.

-top busy-particle.-adj.

(Hiroshi is busy.)

25. Hiroshi-ga ie-o tat-eru.

-nom house-acc build-Caus.pres.

(Hiroshi will build a house.)

This diagnose for stative vs. eventive predicates clearly classifies Japanese lexical inchoatives as eventive verbs, because they pattern with bona fide lexical eventive verbs like *tat-eru* (build-Caus):

26a. Garasu-ga tok-eru.

glass-nom melt-Inch.pres

(Glass will melt.)

⁸⁶ Eventive predicates in non-past form can also describe habitual actions or on-the-scene reports. In what follows, I disregard these irrelevant readings for ease of exposition.

26b. Syatu-ga tizim-aru.
shirt-nom shrink-Inch.pres.

(The shirt will shrink.)

26c. Kyoosyuu-ga horob-iru.
dinosaur-nom extinct-Inch.pres

(Dinosaurs will become extinct.)

As shown in 26, the non-past lexical inchoatives express the future occurrence of the event described by the verb, not the present situation. We can express on-the-scene or habitual situations as in 26 if we add appropriate adverbials or enrich the context. Crucially, however, the present-situation reading analogous to the stative predicate (24) is available neither for the Accomplishment (25) nor for the lexical inchoatives (26), no matter what adverbial we utilize or how we improve the context. This basic fact suggests that the eventive property of the lexical inchoatives in Japanese is on a par with that of Accomplishments, *vis-à-vis* stative predicates.

5.1.2.2.2. Sequence of Time.

Second, it is equally well-known that a particular class of ‘sequence of time’ phenomena applies only to stative predicates in Japanese (Inoue 1989: 175). For instance, when the verb of a matrix clause is in past form, a stative predicate in non-past form in subordinate clauses must describe a situation that persists up to the time

of speech (Inoue *ibid.*: 178).⁸⁷ That is, the embedded stative predicate in non-past form cannot describe a past situation that has already terminated at the time of speech, unless the time of the stative predicate is changed into the past form. (Hence the name of ‘time sequence’ for the phenomenon.) In contrast, in the same environment an embedded non-past eventive predicate expresses an event which is not yet completed at the time of the matrix verb (Inoue *ibid.*: 176). As such, the event described by the subordinate non-past eventive verb may well have been completed prior to the time of speech:

27a. *Kono yakusyo-wa [sen-syuu isog-asi-i kara,] arubaito-o yatot-ta.
 this office-top last-week busy-particle.-adj. because] part.time-acc hire-past
 (This office hired a part-timer, because it was busy last week.)

27b. Watasi-wa [tihoo-e tenkin-suru node,] tenkin-todoke-o dasi-ta.
 I-top countryside-to transfer-do because transfer-notice-acc submit-past
 (I submitted the transfer notice, because I would/will transfer to a countryside.)
 (Inoue 1989: 178 and 176. Her (21c) and (10). The star is hers.)

In 27a, the non-past stative predicate in the embedded clause only describes the situation continuing up to the speech time. On the other hand, the non-past eventive verb in the lower clause expresses the event which is not yet completed at the time of the matrix verb in 27b.

⁸⁷ Stative predicates in this environment can also express past habitual or ubiquitous truth. I abstract away from those readings for they are irrelevant in the current context.

Applying this test to the lexical inchoatives, again, we see that the lexical inchoatives in Japanese (28b-d) pattern with Accomplishments (28a):

28a. Hiroshi-wa Shigeru-ga ie-o tat-eru node, Masaru-o yon-da.
-top -nom house-acc build-Caus. because -acc call-past

(Hiroshi called Masaru because Shigeru would/will build a house.)

28b. Hiroshi-wa garasu-ga tok-eru node, Masaru-o yon-da.
-top glass-nom melt-Inch because -acc call-past

(Hiroshi called Masaru because the snow would/will melt.)

28c. Hiroshi-wa syatsu-ga tizim-aru node, Masaru-o yon-da.
-top shirt-nom shrink-Inch. because acc call-past

(Hiroshi called Masaru because the shirt would/will shrink.)

28d. Q-wa kyooryuu-ga horob-iru node, entaapuraizu-o yon-da.
-top dinosaur-nom extinct-Inch. because Enterprise-acc call-past

(Q called the Enterprise, because dinosaurs would/will become extinct.)

To sum up so far, the temporal properties displayed by lexical inchoatives in Japanese strongly suggest that they belong to the eventive class, exactly parallel to bona fide eventive lexical verbs like Accomplishments.

5.1.2.2.3. Japanese as a Language with Few Lexical Stative Verbs.

The last argument I present for the normal status of Japanese verbs involves previous research on such expressions in Japanese (Moriyama 1988, Jacobsen 1992, McClure 1995). In general, it is claimed that this language is in the process of losing lexical stative verbs, so much so that some scholars claim there are only three pure lexical stative verbs: *iru* (be), *aru* (be), and *iru* (need) (McClure *ibid*). Historically, the ‘pressure’ is on pure lexical stative verbs to turn into adjectives in Japanese (McClure *ibid*). In addition, a number of lexical verbs that are canonically stative in English, such as *ai-suru* (love), *wakaru* (understand), *niru* (resemble), are classified into inchoatives in Japanese. Likewise, so-called traditional Class IV lexical stative verbs in Kindaichi (1976) have been re-classified into lexical *inchoative* verbs based on their temporal properties in recent research (McClure *ibid*, Moriyama *ibid*, *inter alia*).

If indeed many lexical stative verbs that are canonically stative in other languages are Achievements/inchoatives in Japanese, as suggested in Jacobsen 1992, then the Japanese lexicon includes numerous eventive verbs and a handful of stative verbs. In other words, inchoative verbs in present-day Japanese are eventive, but what look like stative verbs may well be inchoatives too. Crucially, however, it is not the other way around: lexical inchoatives may not be taken to be lexical stative verbs, or adjective-like. This line of research plausibly suggests that lexical inchoatives are unlikely to be stative, or adjective-like in Japanese.

I have presented three arguments supporting the view that lexical inchoatives are unlikely to be adjectives or stative predicates. As a consequence, it must be a genuine 3rd dimensional inchoative VP (or the 2nd dimensional stative VP, where applicable) that is elided in VP ellipsis instances involving *soo naru* (become so) and *soo suru* (do so) in Japanese –and not some putative adjective by itself. The crucial point is that lexical inchoatives are simply not equivalent to adjectives; the former have richer dimensional structures as bona fide lexical eventive verbs.

5.1.3. Derivations of VP Ellipsis.

In this subsection I present in more detail the processes of VP ellipsis in Japanese, for examples introduced in the previous subsection. I assume that VP ellipsis is a deletion operation under identity. This is spelled out in Lasnik (1999) as in 29:

29. Assumptions on the VP ellipsis:

A form of a verb can only be deleted under identity with the very same form (Lasnik 1999: 112. his (66a)).

The VP ellipsis examples in the preceding subsection involve the following classes:

30.

- a. Causatives (the 5th VP) anteceding inchoatives (the 3rd VP)
- b. Inchoatives (the 3rd VP) anteceding causatives (the 5th VP)
- c. Resultative-state perfects/States (the 3rd/2nd VP) anteceding causatives (the 5th VP):
- d. States (the 2nd VP) anteceding Causatives (the 5th VP)

I first deal with the cases in 30a, for they fit the standard instantiation of VP ellipsis.

The relevant example is repeated here as 31-32:

Causatives (the 5th VP) anteceding inchoatives (the 3rd VP):

31. (=6a.) Hiroshi-ga syatsu-o tizim-e-ta. Nekutai-mo soo nat-ta
-nom shirt-acc shrink-Caus.-past tie-also so become-past
(Lit.: Hiroshi shrank the shirt. The tie became so (=shrank), too.)

32. (=7a.) Hiroshi-ga gurasu-o tok-asi-ta. Purasutikku/kappu-mo soo nat-ta
-nom glass-acc melt-Caus.-past plastic/cup-also so become-past
(Lit.: Hiroshi melted the glass. The plastic/cup became so (=melted), too.)

The structures of the VPs for examples 31 and 32 at the point of VP deletion are depicted in 33 and 34. I code the overt causative morphemes *-as* and *-e* as ‘Caus.’,

the tense as ‘past’, and show the verb stem *tizim-* (shrink) and *tok-* (melt) in English for ease of presentation:^{88, 89}

33a. ... past ... Hiroshi ... shirt ... [_{5 VP} Caus. [_{3 VP} [_{1 VP} shrink-]]]

(Hiroshi shrank the shirt)

b. ... past ... tie ... [~~_{3 VP} [_{1 VP} shrink-~~]]] (The tie became so (=shrank), too.)

34a. ... past ... Hiroshi ... glass ... [_{5 VP} Caus. [_{3 VP} [_{1 VP} melt-]]]

(Hiroshi melted the glass)

b. ... past ... plastic ... [~~_{3 VP} [_{1 VP} melt-~~]]] (The plastic/cup became so (=melt), too.)

As seen above, the underlined inchoative 3rd VP in the antecedent verb phrase is identified with that in the second sentence, and the latter is elided. The stranded tense is supported by the pro-verb ‘become’.

I now turn to the examples 30a-c. The examples in 33 and 34 we just saw exemplify standard cases of VP ellipsis in the deletion approach to VP ellipsis.

However, the following patterns of VP ellipsis raise an issue for this approach:

⁸⁸ I assume that the Theme DP is already out of the to-be-elided VP when deletion applies. I have claimed that the amalgamation of verb affixes takes place at PF. Thus I must assume that the derivational verb morphemes utilize Agree in the lexical structure to get the Theme out of the lexical VP prior to handing the lexical structure to PF for VP deletion in Japanese. See also Lasnik (1999, Appendix. Page 116)

⁸⁹ The DP arguments, ‘Hiroshi’, ‘shirt’, ‘tie’, and the tense element ‘past’ are structurally positioned as in 33 - 34 only for expository purposes. As long as they are out of the (to be) elided VP, their precise positions do not have any effect on my point.

35. Inchoatives (the 3rd VP) antecedent causatives (the 5th VP):

Garasu-ga tok-e-ta. Hiroshi-ga soo si-ta
 glass-nom melt-Inch.-past -nom so do-past

(Lit.: The glass melted. Hiroshi did so (=caused the glass to melt).)

36. States (the 2nd VP) antecedent Causatives (the 5th VP):

(=14a.) Konpuutaa-no modemu-ga tukue-no ue-ni ar-u
 computer-gen modem-nom desk-gen top-at be-pres.
 Hiroshi-ga soo si-ta
 -nom so so-past

(Lit.: The computer's modem is on the desk. Hiroshi did so (=caused it to be on the desk).)

At the point of VP ellipsis, the relevant part of the VP structure looks like this. As before, I depict the inchoative morpheme, *-e*, as 'Inch.':

37a. ... past ... water ... [_{3 VP} Inch. [_{1 VP} melt-]] (The glass melted.)

b. ... past ... Hiroshi ... water ... [_{5 VP} ... [_{3 VP} (?) [_{1 VP} ~~boil~~]]]

(Hiroshi did so (=caused it to melt).)

38a. ... past .. computer's modem ... [_{2VP} on-the-desk [_{1 VP} be-]]

(The computer's modem is on the desk)

b. ... past ... Hiroshi ... computer's modem ... [_{5 VP} ... [_{2VP} ~~on-the-desk~~ [_{1 VP} ~~be~~]]]

(Hiroshi did so (=caused it to be on the desk).)

There are two points that need to be addressed here, involving elements inside and the outside of the elided VP. The first is that the overt inchoative morpheme *-e* in the antecedent clause in 37a must have been present in some fashion in the elided VP in 37b, for the identity requirement to be satisfied. This phantom element in 37b is depicted as '(?)'. The second is how the invisible 'extra' structures of the causatives hosting the structurally smaller elided VP in 37b and 38b are to be recovered. There, the 4th and 5th VPs are left 'stranded' outside the elided VP, so to speak, since the elided VPs are the 2nd or 3rd VP, each involving the identity requirement in 37a and 38a. I deal with these matters in the following two subsections, starting with the second question first. It turns out that those two questions are closely related to the VP architecture I propose.

5.1.3.1. Recoverability of Orders of Dimensionality Complexities in VP

Ellipsis: The Choice of the Pro-Verb Form.

To answer the second question, notice that the choice of light verbs reflects the class of predicates elided. That is, the shape of the light verb will help recover the

structural complexity of lexical verbs, or the invisible ‘stranded’ layers of the dimensionalities involved in the ellipsis in the lexical structure:

39a. Usagi-wa hoorensuu-o konom-u
rabbit-top spinach-acc favor-pres.

(Rabbits favor spinachs.)

b. Yagi-mo soo da/de-aru/*suru
goat-also so affirm.pres/DE-be/do.pres.

(Lit.: Goats are so (=favors spinachs), too.)

40a. Tweety-wa Bunny-o totemo nikun-de-i-ta
-top -acc lots hate-DE-be-past

(Tweety hated Bunny a lot.)

b. Garfield-mo soo dat-ta/*si-ta
-also so DE.be-past/do-past

(Garfield was so (=hated Bunny a lot), too)

As shown in 39b and 40b, States require their light verbs to be of the form ‘be’.⁹⁰

This is so since *da* can be decomposed into *de-aru*, the ‘continuous’ particle *de-* plus *ar* (be). The use of *sur* (do) is rejected in these instances.

⁹⁰ In 40a, a *be* form of *ir* (be) is used in the antecedent. This is replaced by another form of *be*, *ar* in the elided VP in 40b. How exactly these VP ellipses work, again, is beyond the scope of the present work.

The light verb *sur* (do), on the other hand, is well-formed only with eventive verbs:

41a. Hiroshi-ga Masaru-o tatai-ta.

-nom -acc hit-past

(Hiroshi hit Masaru.)

b. Takashi-mo soo si-ta/*nat-ta/?*dat-ta

-also so do-past/become-past/DE.be-past

(Takashi did so, too.)

42a. Masaru-ga nai-ta.

-nom cry-past

(Masaru cried.)

b. Takashi-mo soo si-ta/*nat-ta/?*dat-ta

-also so do-past/become-past/DE.be-past

(Takashi did so, too.)

In the same vein, *sur* (do) is the choice of the light verb when referring back to the Activity (4th dimensional VP) eventuality, which is ‘contained’ in an antecedent causative eventuality (5th dimensional VP). (See section 2.3, chapter 2):

[Scenario: Hiroshi is a movie director. Masaru and Takashi are actors. They both are reluctant to cry loudly in one of the scenes for the movie. However]:

43. Hiroshi-ga Masaru-o oogoe-de nak-asi-ta node,
 -nom -acc loud-adv. cry-Caus.-past because
 Takashi-mo sibilibu soo si-ta/*nat-ta/*dat-ta
 -also reluctantly so do-past/become-past/DE.be-past
 (Lit.: Because Hiroshi cried Masaru out loud (=made Masaru cry out loud),
 Takashi reluctantly did so (=Takashi cried out loud), too.)

In 43b, Takashi deliberately engages in the act of crying out loud as an actor. This event can only be referred to by the pro-form *sur* (do), not *nar* (become) or *da* (be).⁹¹ I propose that this ability of the pro-verbs to ‘code’ the dimensional complexity is also at work in the examples in 13-17, 37b, and 38b, appropriately allowing us to recover relevant orders of dimensional complexity.⁹²

⁹¹ Readers are reminded that *-as* is a *lexical* causativizer, to be compared to the *external* causativizer (*s)ase-* (cause) (see also footnote 24 in chapter 2). The conjugation patterns for the two are quite different, and only the latter can add an internal Agent with dative Case. This is clear with *cry*:

(i) Hiroshi-ga Masaru-ni Takashi-o *nak-asi-ta/nak-ase-ta
 -nom -dat -acc cry-Caus.-past/cry-Ext.Caus.-past
 (Hiroshi made Masaru to cause Takashi to cry.)

⁹² Again, this poses the issue of what happens in English, and why either the pertinent transparency is impossible in this language or the necessary elliptical forms do not play the role they do in Japanese, as already alluded to in fn. 84. More on this shortly.

To sum up, the predicate pro-form *ar* (be) can be taken to recover the 2nd order of dimensionality (States), *nar* (become) the 3rd order, and *sur* (do) the 4th and 5th order.

There is one complication, though, to this generalization:

44a. Hiroshi-ga Masaru-o tatai-ta.

-nom -acc hit-past

(Hiroshi hit Masaru.)

b. Takashi-mo soo si-ta/ soo da

-also so do-past/ so DE.be.**non.past**

(Lit.: Takashi did so/ is so, too.)

As shown in bold in 44b, the non-past form of *da* (DE.be) can code the hitting eventuality anteceded by the Activity 4th VP in 35a. That is, the event described in 46b is not the one where ‘Takashi’ is in some state: rather, ‘Takashi’ is the hitter.

I suspect that this piece of data is also derivable from the architecture of the structure of lexical verbs proposed here. Recall that the 1st dimensional VP is special in the sense that this is where it all begins: it is the Base for any VP with any order of dimensional complexity. It is then no surprise if a pro-form of the 1st VP is used to represent the whole VP. Therefore I suggest that the *ar* (be) in 44 is the light verb for the 1st VP, which happens to take the same surface form as the one for the 2nd VP, *ar*. This light verb has a special status in VP ellipsis in that it can represent the whole

event as the pro-form of the 1st dimension, the Base, but I will not be able to argue for this idea.

In sum, I suggest that the ‘stranded’ complexities of lexical structures in 46 can be recovered by the choice of the light verb. This supports the proposal that each layer of dimensional complexity in verbs is syntactically real. The light verbs, or the pro-verb forms, for each order of dimensionalities can be summarized as follows:

45. pro-verb forms for each order of dimensionalities:⁹³

orders of dimensions:	1 st VP	2 nd VP	3 rd VP	4 th and 5 th VP
pro-verb forms:	<i>ar</i> (be) non.past	<i>ar</i> (be) any tense	<i>nar</i> (become)	<i>sur</i> (do)

5.1.3.2. Identification of ‘Phantom’ Inchoative Morphemes in VP

Ellipsis.

I now return to the first question I posed for examples in 37 and 38. Readers may recall that it pertains to VP ellipsis of the sort in 46-48. The antecedent 3rd VP contains an inchoative morpheme, *-ϕ*, *-e*, *-a*, or *-i*, whereas the corresponding elided 3rd VP does not:

⁹³ More accurately, the *(u)r* phonemes on the pro-forms are default/filler phonemes. There are also further complications to the matter at stake in 45, but my purpose now was merely to establish the rough correlation between the choice of the pro-verbs and the dimensional complexity of the elided VPs.

Inchoatives (the 3rd VP) antecedent causatives (the 5th VP):

46. (=13a) Oyu-ga wai- ϕ -ta. Hiroshi-ga soo si-ta.
hot.water-nom boil-Inch.-past -nom so do-past
(Lit.: The water boiled. Hiroshi did so (=caused it to boil).)

47. (=24) Garasu-ga tok-e-ta. Hiroshi-ga soo si-ta
glass-nom melt-Inch.-past -nom so do-past
(Lit.: The glass melted. Hiroshi did so (=caused the glass to melt).)

48. Gesui-kan-ga tum-at-ta. Hiroshi-ga wazato soo si-ta.
sewage-pipe-nom get.stuck-Inch.-past -nom intentionally so do-past
(Lit.: The sewage pipe got [viz. be filled and became] stuck. Hiroshi
intentionally did so (=caused it to get stuck).)

The relevant parts of the VP at the point of the deletion for 46, 47, and 48 are each depicted in 49-51:

49 a. ... past ... water ... [_{3 VP} Inch. [_{1 VP} boil-]] (The water boiled.)
b. ... past ... Hiroshi ... water ... [_{5 VP} ... [_{3 VP} (?) [_{1 VP} boil]]]
(Lit.: Hiroshi did so (=caused it to boil).)

50 a. ... past ... glass ... [_{3 VP} Inch. [_{1 VP} melt-]] (The glass melted.)

b. ... past ... Hiroshi ... glass ... [_{5 VP} ... [_{3 VP} (?) [_{1 VP} ~~melt~~]]

(Lit.: Hiroshi did so (=caused it to melt).)

51 a. ... past ... pipe ... [_{3 VP} Inch. [_{1 VP} get.stuck-]] (Lit.: The pipe got.stuck.)

b. ... past ... Hiroshi ... glass ... [_{5 VP} ... [_{3 VP} (?) [_{1 VP} ~~get.stuck~~]]

(Lit.: Hiroshi did so (=caused it to get.stuck).)

The question thus is why all the bona fide inchoative derivational morphemes in the antecedent VPs, coded as ‘Inch.’ in 49-51, can be ignored for the purposes of identity, as required for VP ellipsis.

I suggest that exact identity is not required for the lexical verb domain because of the nature of the syntactic architecture of the lexical structure that I am proposing, so long as precise non-distinctness, in a sense to be made precise immediately, is present. When coupled with economy considerations on the identification process, this brings the desired results for examples 49-51. The economy condition can be stated as follows:

52. Economy for the identification process of VP ellipses:

Identify the orders of dimensional complexity for ellipsis purposes only up to the recoverability of the deleted elements.

Recall that the lexical verb structure is constructed through topological induction. As discussed at length in chapter 2, an n^{th} dimensional object entails any $n\text{-}m^{\text{th}}$ dimension. This means that a pro-form for the 5^{th} dimensional VP, for example, entails all the previous orders of dimensional complexities. This tight entailment relation, guaranteed by the very architecture of topological syntax, is what ameliorates the strict identity requirement in the lexical verb domain in 49-51. To put it intuitively, we know that the 5^{th} VP is ultimately built on the 3^{rd} VP. Therefore, the strict, morpheme to morpheme, identity is not required for VP ellipsis in the derivational morphology pertaining to the lexical verb domain: the 3^{rd} VP is in relevant respects non-distinct from the 5^{th} VP, even if identity doesn't hold. That is why the inchoative morphemes of the antecedent VP do not require an exact match inside the (to-be-) elided VP in identifying the lexical structures.

Similar results cannot obtain in English. This is, to start with, because in terms of derivational morphology, as mentioned from the start English doesn't have the relevant parametric setting to access this kind of information, as already alluded to in fn. 84, a problem that I return to shortly, but whose full clarification must await future research. And as for inflectional morphology, the problem there is that, so far as I can tell, one doesn't have in this domain the tight implicational structure that I have argued for in this thesis. That is, whereas one can argue that various types of VPs within the Vendler scale imply one another, it is not obvious in what specific sense,

for instance, T *implies* VP or some similar notion.⁹⁴ That limits the work that condition 52 can do on allowing drastic ellipses under mere non-distinctness, as opposed to full identity.⁹⁵

I have attributed what looks like ‘identification mishaps’ in VP ellipsis to the tight entailment patterns in the lexical verb domain, and a reasonable economy condition for recoverability of dimensional complexities. I now present two more classes of pertinent data, this time, from the semantic side of things. The data argue for the PF merge analysis of lexical verbs in Japanese, contrary to what we find in English, a language that introduces verbs into syntax already in the form of a complete ‘word’.

⁹⁴ Various researchers have shown temporal properties within nominals, and some have argued for a TP projection within the nominal domain (see for instance Gueron and Lecarme (2004)). Be that as it may, I see no reason, at least of the sort invoked in this thesis, to consider T and V as elements of the same type, and hence implicational issues of the sort alluded to here are entirely moot.

⁹⁵ A (conceivably) relevantly related instance is pointed out by Lasnik (1999:113):

- (i) a. John may be questioning our motives, but Peter hasn’t.
b. John may be ing question our motives, but Peter pres have not ~~en question out motives~~ ...
- (ii) a. Peter saw Mary last week, but he hasn’t since
b. Peter past see Mary ..., but he pres. have not ~~en see Mary~~ ...

As in (i)b and (ii)b, after sub-constituents are identified and deleted, the perfect morpheme *-en* is stranded, but the ellipses are well-formed. In other words, these *-en* morphemes are ‘ignored’ for the purposes of identification. In his fn. 18 Lasnik observes: “... it is as if the stranded ‘*-en*’ is spelled out as zero, much as stranded Infl is spelled out as a form of ‘do’”. Perhaps perfective *-en* is to be analyzed in the dimensional terms I advocate here, with essentially the same consequences, in this instance, for the analysis I sketched for Japanese. What needs to be seen, however, is why this particular morpheme is different from others in English, a matter that I will not go into.

5.2. Semantic Evidence: The ‘Lexical Integrity’ of Causatives in English and Japanese.

The ‘PF versus overt syntax’ proposal advocated in this chapter also swings in tandem with Baker’s (1988) analysis. Baker proposes that French external-causative constructions are derived from the LF incorporation of an external-causativizer.⁹⁶ He motivates this through the fact that the French external-causative constructions display no overt syntactic incorporation, but still exhibit the semantic effects characteristic of the external-causativization involving overt incorporation of a causativizer head to a higher predicate. Thus it must be in the LF component that the incorporation of the external-causativizer head takes place in French, creating the observed semantic effect at this level of representation. In this spirit, and basically as the mirror image of that state of affairs, it is possible that yet another language, in this instance Japanese, puts the pieces of the derivational verb morphemes together *in the PF component*, but actually feeds them separately to LF. As a consequence, if this possibility does emerge, Japanese lexical verbs exhibit the characteristics of a

⁹⁶ Baker deals with what I classify as ‘external’-causativizers. External-causativization takes as its input lexical verbs. As a consequence, further causativization of a lexical causative verb is possible with an external-causativizer, adding an internal Agent and creating a four-place predicate for *build*, for example. This is much like *make/cause* in English and *-(s)ase* in Japanese (see also footnote 24 in chapter 2 and footnote 91 in this chapter):

- (i) Hiroshi-ga Masaru-ni Hanak-ni ie-o tat-e-sase-ta
-nom -dat -dat house-acc build-Caus.-Ext.Caus.-past
(Lit.: Hiroshi make.build Masaru Hanako a house. (=Hiroshi made Masaru build Hanako a house.))

I use the term ‘causatives’ in the text to stand only for the lexical causative verbs.

morphologically assembled lexical verb head on the PF side; but at the same time, the lexical verbs reach the LF component unassembled in separate pieces, yielding, in particular, a somewhat looser causative interpretation for a lexical causative, as compared to the canonical one seen in English –a language that takes out lexical verbs from the lexicon already assembled as a word.

In the remainder of this chapter I argue for this possibility based on the [Affixal] and [+Featural] strategies introduced above, through contrasting semantic data from English and Japanese. Specifically, in this and the succeeding sections I present two classes of semantic evidence on ‘lexical integrity’ of causatives and on inchoative perfects to support the analysis. Given a natural (hopefully even trivial) syntax-semantics mapping, these pieces of evidence together serve as arguments for the syntactic constituency of the lower dimensional VP within a more complex VP. To give a road-map of the argument, first I layout my assumptions (section 5.2.1); next, I attempt to measure the ‘lexical integrity’ of lexical causatives verbs in English and Japanese, through: (a) adverbial modifications, (b) the canonicity of causing actions, and; (c) subevent entailment patterns (section 5.2.2).

5.2.1. Assumptions.

Specifics of my proposal on the amalgamation of derivational verb morphemes, and the concomitant syntax in English and Japanese, are spelled out in 53 and 54 for ease of reference:

53. Assumptions for lexical verbs and feature-checking in the lexical domain:

- a. The CI component reads the orders of dimensional complexity off of lexical verbs if those are available in the form of a 'word' (i. e. if a verb stem has its derivational morphemes attached to it). If a 'word' is not available, the CI reads the orders of dimensional complexity off of the lexical structure itself.
- b. Checking of (derivational morpheme) features under the [+Featural] strategy in lexical verb structures is purely formal and syntactic, and thus has no semantic consequence.

54. Proposal for amalgamating derivational verb morphemes of lexical verbs:

- a. A lexical verb in English is already fully assembled into a word when it is introduced into syntax, with derivational morphemes already attached to it in the lexicon. A lexical verb checks its derivational morpheme features within lexical verb structures through a series of feature-checkings.
- b. A lexical verb is not assembled into a word in the lexicon in Japanese. Thus independent pieces of derivational verb morphemes are introduced into syntax. These derivational verb morphemes are put together into a lexical word at the PF component through morphological needs demanding adjacency of the derivational morphemes. Whatever syntactic procedures are required upon these derivational morphemes on the syntactic side is executed through the process of Agree.

As in 53a, I adopt the assumption that the CI primarily interprets a ‘word’ if it is available. Thus a lexical verb already assembled into a word in the lexicon is interpreted for whatever order of dimensionality it codes. On the other hand, when derivational morphemes reach the LF unassembled, the system has no option but to interpret the lexical verb structure itself with the derivational morphemes ‘scattered over’ the lexical verb structure.⁹⁷ The former is the case for English lexical verbs and the latter for Japanese, given the proposal in 54. When coupled with 53b, this yields a characteristic class of semantic effects on verb interpretation in English and Japanese, as we will see.

I am essentially trying to instantiate the idea that an element integrated into a lexical verb –be it in the lexicon or in narrow syntax for that matter—⁹⁸ cannot yield interpretations involving ‘reconstruction’ of the amalgamated heads, as is generally the case for incorporated heads.⁹⁹ In contrast, if derivational verb morphemes reach LF scattered over the tree, the case in Japanese, then they are fed into the CI

⁹⁷ I owe this useful metaphor to Paul Pietroski (p.c.).

⁹⁸ Readers are reminded that, in this thesis, ‘narrow syntax’ includes the lexical verb structure that I have been talking about all along. A ‘lexicon’, on the other hand, is a collection of objects that can feed into syntactic derivations (cf.: Footnote 70 in section 5.1.1).

⁹⁹ This also applies to some N⁰ incorporation to a lexical V⁰. For example:

- (i) hunting a deer
- (ii) deer-hunting

(i) is not exactly synonymous to (ii) in that the latter expresses a sub-class of hunting, namely, that specialized on deer.

component to be interpreted in-situ, in a significantly different fashion.¹⁰⁰ This has direct semantic consequences within the topological syntactic structures presented here, wherein each order of dimensional complexity is tightly tied to an eventuality with corresponding semantic complexities in the CI. For example, lexical causatives (the 5th VP) in English do not allow reference to a lower dimensional VP contained within them, for instance the one denoting an inchoative eventuality (the 3rd VP). Contrarily, Japanese causatives readily permit interpretations tied to an inchoative eventuality within the whole causative event, as we will see.¹⁰¹

5.2.2. ‘Lexical Integrity’ in English and Japanese Lexical Causatives: Adverbial Modifications, Canonically, and Subevent Entailments.

First, I present arguments based on adverbial modifications and the canonicity of causing actions with lexical verbs. As reported in Fodor (1970), lexical causatives in English do not allow separate time adverbials to modify subevents of the event denoted by the causatives.¹⁰² Contrarily, periphrastic causatives, involving light verbs, do allow it:

¹⁰⁰ See chapter 6 for the precise structural positions of each derivational verb morpheme in Japanese.

¹⁰¹ In fact, we have already seen arguably related ellipsis paradigms in section 5.1.2 above; this may well be the explanation for the different behavior qua ellipsis in each language, as mentioned in passing in fn. 84.

¹⁰² A similar example is reported in Pietroski (2005:186), where these matters are discussed at length.

[Scenario: Floyd engages himself in some activity on Monday, which leads to a glass' melting on Tuesday.]

55a. *Floyd melted the glass on Tuesday by heating it on Monday

55b. Floyd caused the glass to melt on Tuesday by heating it on Monday

In (55a) adverbial modification is clearly banned with the lexical causatives. This is in sharp contrast to the example in (b), which is overtly bi-clausal, involving two pieces of verbs. This contrast is taken to be exhibiting the 'lexical integrity', or 'wordhood', which is supposedly what separates the lexical causatives (55a) from the periphrastic or 'bi-clausal' examples (55b).

As per assumption 53a, Japanese interprets derivational morphemes scattered over the structure, rather than as a 'word'. Then, an analogous example to 55a should be acceptable in Japanese. This prediction is directly borne out:

[Scenario: Same as 54.]

56. Hiroshi-ga mizu-o getuyoobi-ni wak-asi-ta-ga,
 -nom water-acc Monday-on boil-Caus.-past-but

 mizu-wa kayoobi-made waka- ϕ -nakkat-ta
 water-top Tuesday-until boil-Inch.-neg.-past

(Lit.: Hiroshi boiled the water on Monday, but the water didn't boil until Tuesday.)

The contrast in 55a vs. 56 receives a natural account under the present proposal. Notice that 55 patterns with the overt bi-clausal causatives in 54b and 55b, which contain separate verb pieces. Example 56 is well-formed since lexical constituency is still ‘visible’ in Japanese, thanks to the CI interpreting the lexical structure itself, not the lexical verb. This is so if indeed the lexical structure, not the lexical verb, is interpreted in Japanese. In other words, Japanese lexical causatives still retain their ‘bi-clausality’, just like the overt bi-clausal causatives in English do. The separate pieces of derivational verb morphemes are scattered over the structure in Japanese at LF. English, on the other hand, feeds LF with a lexical verb already fully assembled into a ‘word’. As per assumption 53a, then, the CI sees this single symbol, a ‘word’, in English, and opts to interpret the amalgamated lexical verb, instead of the lexical verb structure itself. This is how 54a/55a and 56 exhibit the contrast.

It is not the case, however, that Japanese lexical verbs do not show *any* lexical integrity at all.¹⁰³ As often discussed, a lexical causative verb in general requires a certain amount of canonicity on the class of actions that lead to the attainment of the subevent within the causative eventuality it describes. That is, not just any plain action can be identified as the causing action in lexical causatives, as 57a shows. Notice that this restriction is not apparent for periphrastic causatives, as in 57b:

¹⁰³ Which of course then poses the question, yet again, of what ‘lexical integrity’ ultimately boils down to. I don’t have anything to contribute to this puzzling matter, and see Uriagereka (forthcoming: chapter 7) for a proposal consistent with my approach.

[Scenario: A pot of water is on a table in a house. Bill sets the house on fire, without knowledge of the pot of water. In the process, the pot of water boils by the heat of the fire associated with the arson.]

57a. #Bill boiled the water.

57b. Bill caused the water to boil.

[Pietroski, 2005:184]

It is infelicitous to describe the situation in the scenario in English with the lexical causative verb in 57a, vis-à-vis what we witness in 57b, which is overtly bi-clausal, involving two verb pieces. The class of the ‘causing actions’ that lead to the attainment of the subevent (of water’s boiling in 57) in lexical causatives must be, in some sense, ‘of the right sort’, as Pietroski 2005:184 observes.

Notice that this canonicity requirement is valid also in Japanese lexical causatives:

[Scenario: Same as 57.]

58. #Hiroshi-ga oyu-o wak-asi-ta
 -nom hot.water-acc boiled-Caus.-past

(Hiroshi boiled water.)

The infelicitous status of example 58 strongly suggests that a lexical causative manifests a certain amount of ‘wordhood’ in Japanese as well –it is not totally identical to the overt bi-clausal structures in 57b, at least in terms of canonicity of causing action. But at the same time it is plainly similar to the overt bi-clausal causatives in terms of adverbial modification as we have seen previously. This is exactly what we expect if Japanese lexical causatives are *lexically* ‘bi-clausal’. The syntactic lexical structure retains bi-clausality in that the CI only gets to read the basic bi-clausal structures underlying the lexical causatives in Japanese, there being room for the adverbial modifications on the lexical structures –which accounts for the adverbial modification data. However, lexical causatives are, after all, semantically formatted in ways that are characteristic of a ‘word’, whatever that ultimately means. These ways presumably include something pertaining to existential quantification by event quantifiers, which is what glues together a causative eventuality into one coherent, whole event. In some way this must be the source of the ‘canonicity’ seen in 58.¹⁰⁴

Next I present an argument for constituency within a lexical verb structure based on subevent entailment patterns of lexical causatives. The subevent entailment patterns of lexical causatives in English and Japanese suggest a somewhat ‘loose’ causativity for Japanese, vis-à-vis the situation arising in corresponding English structures:

¹⁰⁴ Although why such restrictions (specifically in terms of canonicity) should emerge is far from obvious.

59a. Sam burnt the book, but the book didn't burn. [=Contradiction.]

59b. Hiroshi-ga hon-o moy-asi-ta-ga,
 -nom book-acc burn-Caus.-past-but

hon-wa moy-e-nakka-ta

book-top burn-Inch.-neg.-past

(Hiroshi burnt the book, but the book didn't burn. [=Not a contradiction.]

[(Ikegami 1986)]

It is well-known that subevent entailments can be overtly negated in Japanese lexical causatives (59b), which is simply not possible in English ones (59a).¹⁰⁵ I claim that

¹⁰⁵ One more puzzling (ultimately problematic) piece of data is pointed out to me, independently, by both H. Lasnik and N. Hornstein (p.c.). Observe:

- (i) a. John made the book burn. But the book didn't burn.
- b. John caused the book to burn. But the book didn't burn.

In these bi-clausal English instances some form of unacceptability obtains when the further comment is added. I do not know why this is. For what it's worth, to my ear (ia) sounds worse than (ib). Obviously the former involves more tightly related morphemes (without the intervention of the T morpheme *to*), a point that might be significant in understanding these recalcitrant data, especially in light of the specific mechanisms I discuss in this section. This observation is further supported by the following data:

- (ii) a. John had the book burnt. But the book didn't burn.
- b. John had the book be burnt. But the book didn't burn.

Most natives report significant improvement with (iia) vis-à-vis the examples in (i) (also with (iib), though to a lesser degree). Again, this causative light verb *have* in English clearly does not take infinitival complements introduced by *to*. These data suggest that some sort of scale, for lack of a better term, exists for the tightness of event causation: *cause/get* being yielding the most remote dependency, *have* the closest, and *make* somewhere in between. Needless to say, derivations of those light

this is also due to the syntactic differences associated with the amalgamation of lexical verbs in English and Japanese. Since the lexical structure itself is interpreted in Japanese, there is more room for negation under the assumption that negation operates based on constituency. On the other hand, it is hardly possible to ‘reach’ into an already integrated lexical word and negate only one of its derivational morphemes on a lexical word.¹⁰⁶ (Again, keep in mind that English verbs are introduced into syntax already assembled into a lexical word.) This continues to speak for the availability of constituency for the lexical verb structure in Japanese, contrary to what we expect for English.¹⁰⁷

In my view derivational verb morphemes in Japanese reach the LF in a somewhat scattered manner, while English ones feed LF already assembled into a single unit, a ‘word’. To the extent that the CI interprets a ‘word’ whenever it is available, and that the CI resorts to interpreting the lexical verb structures themselves when no ‘word’ is around to be identified, the pieces of evidence I have just discussed support the different syntactic processes involved in the amalgamation of lexical verbs across

verb constructions must be clarified especially in contrast to Japanese data with lexical verbs. I leave these for further research.

¹⁰⁶ Uriagereka (1998) discusses this matter at length in his chapter 6, attributing the observation to Emmon Bach.

¹⁰⁷ Some event modifiers are actually allowed to modify into certain orders of dimensional complexities in English as well. These include: Instruments (into the 4th VP), Ornaments (into the 3rd VP), Inner Locatives (into the 2nd VP), and possibly more. The question is why this is not possible with certain time adverbials. I leave this very puzzling matter for future research.

languages, in particular in English vs. Japanese.¹⁰⁸ The relevant distinction can be illustrated further when considering resultative-state and past-inchoative interpretations in inchoative perfects in each language.

5.3. Resultative-State Interpretations with Inchoative Perfects in English and Japanese.

We have seen semantic contrasts between English and Japanese lexical causatives which can be deduced from contrasting methods of amalgamating lexical verbs. In this section, I present another piece of evidence that supports this point. Specifically, I discuss interpretations available in inchoative perfects in English and Japanese. The data argue for the different methods of amalgamating lexical verbs in each language, as well as for the rich, articulated lexical structure for inchoatives under the topological approach.

First I present the relevant data on inchoative perfects in English and Japanese.

Resultative-state interpretations of inchoative perfects are readily available in

¹⁰⁸ I must say I need to assume the ‘hopping down’ of derivational morphemes at PF for some of my words to be assembled in that component. This is so in order to have the head-final structure in Japanese. Otherwise, a right-branching phrase on the lexical verb structure would follow the lexical verb –something that does not standardly happen in Japanese. Alternatively, I need to assume that all materials inside the lexical VP, except for derivational morphemes, for some reason evacuate the lexical VP prior to branching to PF. Then the CI would interpret the copies of moved elements to yield the semantic effect discussed in this section and section 5.3 (see also footnote 77). I will not sort out this point.

Japanese, but not in English (section 5.3.1). Next I present my semantic assumptions for the interpretation of the perfect morpheme in inchoative perfects (section 5.3.2). Thirdly, I discuss the relevant (informal) semantics, which can be deduced from the proposals in this chapter (section 5.3.3). A brief summary follows.

5.3.1. The Data.

I will start by laying out the data on the resultative-state inchoative perfects, defining the linguistic contrasts to be accounted for in this subsection. As is well-known, Japanese exhibits robust resultative-state interpretation with inchoative perfects, but English does not:

60. yuka-ni	hito-ga	ta-ore-te-iru
floor-Locative	man-nom	fall-inch-TE-be.Pres.

(Lit.: A man has fallen on the floor. [This construction can describe the stativity that a man is lying on the floor (now), as a result of having fallen to this floor’])

The resultative-state reading in 60 asserts that a man is lying on the floor now, as a result of him having fallen. The term, ‘resultative-state’ is most appropriate since it accurately describes the duality of this construction: (a) the stativity of the man being on the floor, and; (b) that actually being the result of the immediately preceding eventuality of the man’s falling to the floor (Ogihara 1998).

In other words, the resultative-state interpretation in 60 does not describe a situation as in the formula in 61a below, where ‘fallen’ is taken to be a predicate of an individual. Quite the contrary, the stativity –as it were, the ‘on-ness’– of the man being on the floor must be the result of the immediately preceding ‘man-falling-to-the-floor’ event, which terminates in the state described in 60. Thus 60 translates semantically as illustrated in 61b, not as in 61a:

61a. $(\exists x)[\text{mat}(x) \ \& \ \text{Fallen}(x) \ \& \ \text{On}(x, \text{floor})]$

61b. $(\exists x)(\exists e)[\text{mat}(x) \ \& \ \text{Falling}(e) \ \& \ \text{Theme}(e, x) \ \& \ \text{Onto}(e, \text{floor}) \ \& \ \text{On}(x, \text{floor})]$

The problem that I want to address in this section is two-fold. The first half is the lack of the resultative-state interpretation in English inchoative perfects. Compare 62b to an English equivalent as in 62a. The construction in 62a in English clearly cannot express the resultative-state interpretation:

61a. *?A man has fallen there already for three hours

62b. Hito-ga asoko-ni moo san-zi-kan-mo tao-re-te-iru

man-nom there-Loc already three-hour-duration-Focus fall-inch-TE-be

(Lit. A man has fallen there already for three hours. This construction

describes the stativity of the man lying there already for 30 minutes, as a

result of having fallen to the floor)

Obviously, the English inchoative perfect only describes the inchoative event of falling. (We can call this reading of inchoative perfects the ‘past-eventive’ interpretation.) In contrast, the Japanese equivalent of 62a is perfectly acceptable with the adverbial modifying the resultative-state.

The second half of the data issue that I would like to address here is the fact that sentence 60 in Japanese is actually ambiguous between the resultative-state and the past-inchoative event interpretations. Example 60 is repeated here as 63 with a past-eventive interpretation. This reading can be more clearly exemplified as in 64a, wherein the time adverb ‘before’ disambiguates the past-eventive reading from the resultative-state reading.¹⁰⁹ Example 64a is equivalent to the English inchoative perfect in 64b:

63. yuka-ni hito-ga ta-ore-te-iru
 floor-Locative man-nom fall-inch-TE-be.Pres.

(Lit.: A man has fallen on the floor. [This construction can describe the past inchoative event of a man’s falling to the floor, without mentioning the lasting resultative-stativity associated with the falling event.])

¹⁰⁹ In 63 and 64a, locative adpositions take the form of *-ni* (at) and *-de* (at), respectively. The former is associated with an event, the latter with a state. I argue, however, that rather than being this that disambiguates the resultative and past-inchoative readings in 63 and 64, it is, instead, the past time adverbial that does the trick. (See examples 72 and 73 below.)

64a. Izen hito-ga asoko-de tao-re-te-iru

before a man-nom there-Loc fall-inch-TE-be

(A man has fallen there before/An event of a man's falling there took place before)

64b. A man has fallen there before

As I hope is clear from the gloss, the interpretation in 64a in Japanese is distinctively that of a past inchoative event, not a resultative-stative one.

To sum up the data, the resultative-state interpretation of inchoative perfects is available in Japanese, but not in English. In addition, Japanese has a way to express past-eventive interpretations with perfect inchoatives on a par with English. These are the pieces of data that I will attempt to capture through the contrasting processes of amalgamation of lexical verbs in English and Japanese.

5.3.2. A Semantic Assumption on the Perfect Morpheme.

I assume that the perfect morphemes, *have* in English or *-te-i(ru)* in Japanese,¹¹⁰ introduce a reference time, t^R , at the CI component:

¹¹⁰ Although it is sometimes segmented into *te-ir* or *te-iru*, *-r* on the *-iru* is epiphenomenal and not a part of the stem of the perfect morpheme *i-*. However, I take the stem form of *-i(r-u)* to be *-ir* for ease of presentation in this thesis.

65. Assumption about the semantics of the perfect morpheme:

The perfect morpheme introduces a reference time, t^R , at the CI component, and specifies that t^R be included in the temporal trace of the event e , $\tau(e)$, which the perfect construction describes.

$$[have/ir\ XP] \Rightarrow (t^R) [t^R \in \tau(e) \ \& \ XP]$$

Where 'XP' is the sister node to the perfect morpheme, and $\tau(e)$ is the temporal trace of an event e the perfect morpheme describes.

This semantic assumption ensures a rather straightforward syntax-semantics mapping for perfects, as illustrated in the next subsection.

5.3.3. The Semantics of Inchoative Perfects in English and Japanese.

In this subsection, I illustrate the semantic representations that I will be assuming for the resultative-state and past-eventive interpretations of inchoative perfects, which I take to be an argument for the proposed contrast in amalgamating lexical verbs in English and Japanese. In doing so, I formalize the richer semantic structure for lexical inchoatives, analogous to that for lexical causatives. This, in turn, translates into the richer syntactic structure that feeds into the CI component in my proposal, under the assumption of a simple mapping between syntax and semantics.

Specifically, I will argue that the internal semantic structure of lexical inchoatives involve an eventive description and its resulting state (Dowty 1979). In implementing this idea, I adopt the notion of ‘Terminater’, to draw a parallel between the inchoative semantic structure and that of the causative ones (Pietroski and Uriagereka (2002), Pietroski 2005:180). I will present below the semantic formula for resultative-state inchoative perfects, building it up from a lexical verb and combining it with the perfect morpheme. I then discuss the necessity of the relation ‘Terminater’ in light of the framework assumed in this thesis. Lastly, I sketch the semantic formula for the past-eventive interpretation.

Given the desiderata of a minimalistic syntax-semantics mapping, the semantics for the inchoative perfects should involve two eventualities: an event, say, of falling, and the resulting state of being, say, on the floor as the consequence of that falling event. Given a Neo-Davidsonian approach to verbal expressions, we need to proceed as follows. Recall, first, that the resultative-state interpretation in 60 involves adverbial modification of the resulting stativity, and the past-eventive in 63, modification of the falling event, in the lexical inchoative. Given the enhanced predication opportunity in Japanese lexical verbs, whether the structure is construed as resultative-state or past-eventive, then, is a matter of adverbial predication possibilities.¹¹¹ Suppose that the adverbial is adjoined to the 2nd dimensional VP, the dimensional order for stativity. Then the subsequent introduction of the perfect morpheme to the structure leads to a resultative-state interpretation. This is illustrated

¹¹¹ I owe this insight to convergent observations by both P. Pietroski and J. Nunes (p.c.).

in 67, as semantic formula for 60 (repeated here as 66 with the resultative-state interpretation in Japanese). In 67, two eventualities are described: an event e and a state s (cf.: Pietroski 2005). The former is associated with the event of falling, and the latter with the resulting stativity. The semantic contribution made by the lexical verb is underlined in 67. (I code the modification as ‘Mod (s)’ in 67.):

66. (=60) Japanese inchoative perfects with resultative-state interpretation:

Ima	yuka-ni	hito-ga	ta-ore-te-iru
now	floor-Locative	man-nom	fall-inch-TE-be.NonPast

(Lit.: A man has fallen on the floor now. [This perfect construction can describe the resultative-state interpretation: ‘a man is lying on the floor now as a result of having fallen to the floor’])

67. $(t^R)(\exists s)(\exists e) [t^R \in \tau(e) \text{ Falling (e) \& Experiencer (e, a man) \& Location (e, floor) \& To (e, floor) \& Being-Fallen (s) \& On (a man, floor) \& Theme (s, a man) \& Terminator (e, s) \& **Mod (s)**}]$

I’d like to draw the reader’s attentions to the following two points about formula 67. First, the stativity in 56 is the ‘resultative’ state of the previous falling event. The use of ‘Terminator’ ensures this, because of its semantic definition. Let me show this in detail.

Informally, ‘Terminator (x, y)’ expresses a relation between two eventualities \underline{x} and \underline{y} such that \underline{x} has \underline{y} as its ‘final part’. As such, the Terminator relation guarantees that in a complex event, for example a causative, a causing action terminates with an inchoative event. Terminator is to be construed as a thematic relation in the semantic formula. An eventuality \underline{y} is a Terminator of an eventuality \underline{x} under the following condition:

67’. Terminator (x, y) \leftrightarrow y is a final part of x .

[(Pietroski 2005:180)]

The relation Terminator is originally proposed to capture the relation between a causing action and its resulting inchoative subevent in a lexical causative. As such, the relation is between two events. By adopting the relation Terminator for the semantic representation of lexical inchoatives in describing the relation between the falling event and the resulting state for 66, I am proposing that a semantic relation analogous to the one that obtains between a causing event and its corresponding inchoative subevent also holds between an inchoative eventuality and its resulting stativity (P. Pietroski p.c.). Thus this semantic claim swings in tandem with the two guiding syntactic ideas in this thesis: (a) there is a single operation that relates a dimensionality of the $\underline{n}^{\text{th}}$ order and one of the order $\underline{n+1}^{\text{st}}$, namely the warp (=topological induction); and (b) syntactic orders of dimensional complexity determine matching orders of semantic complexity in the CI.

Thus I minimally revise the definition of Terminator (67'), which holds of between *events*, as in (67'') –in order to accommodate the inchoatives under discussion. The revised relation Terminator in (67''') holds of *an event and a state*, expressing an analogous semantic relation to the one originally proposed (P. Pietroski p.c.):

67''' Terminator (x, y) \leftrightarrow y is a state the Theme is in when the process x ends.

Returning now to the second point, the formula in 56 reflects the claim that the mapping between syntax and semantics involving perfect morphemes is quite simple. As in 67, the proposal is that nothing much happens upon introducing the perfect morpheme *te-ir*. This is possible only with a rich syntax: the bulk of the mechanisms necessary to yield the resultative-state interpretation is already taken care of at the lexical level through the syntactic structure. The availability of a resultative-state interpretation is just a matter of adverbial predication, possibility involving the accessible 2nd VP, which denotes stativity within the whole inchoative event. (I code this modification as 'Mod (s)' in 67.) This lexical structure is translated into the matching semantic formula at the CI component, making it possible to assume a fairly simple semantics of perfect both for English and for Japanese. Specifically, I assume that *-te-* just 'passes up' the relevant semantic value of the ReferenceP. Then the perfect morpheme *-ir* simply introduces the reference time t^R . The semantic assumption for the perfect morpheme (namely, 65) is repeated here as 68a, for ease of reference. Thus, in essence, the composition of a lexical verb with a perfect morpheme yields the formula in 68b, where 'XP' is the denotation of the lexical verb:

68a. (=65) An assumption about the semantics of the perfect morpheme:

The perfect morpheme introduces a reference time, t^R , at the CI component, and specifies that the t^R be included in the temporal trace of the eventuality e , $\tau(e)$, which the perfect construction describes.

$$[have/ir\ XP] \Rightarrow (t^R) [t^R \in \tau(e) \ \& \ XP]$$

Where ‘XP’ is the sister node to the perfect morpheme, and $\tau(e)$ is the temporal trace of an event e the perfect morpheme describes.

68b. $(t^R)[t^R \in \tau(e) \ \& \ XP]$

As a result, the perfect morpheme *-ir* only specifies that the temporal reference t^R be included in the temporal trace of the eventuality that the variable perfect morpheme binds. Notice that this is in sharp contrast to ideas expressed in Ogihara (1998) or even to Parsons (1990). For example, Parsons introduces into the semantic formula a new predicate solely for the perfect interpretation: The relation ‘In-State (\underline{x} , \underline{y})’ holds of an eventuality of \underline{x} denoted by the lexical verb and the resulting stative eventuality \underline{y} that holds as the result of \underline{x} (Parsons 1990). Thus he treats the stativity associated with the perfect constructions separately from the one denoted within the lexical inchoative structure. In my proposal, no such additional primitive is necessary. This move not only provides a simple account for the Japanese resultative-state inchoatives, but also makes the semantics of perfects simpler.

I now present the past-eventive interpretation of inchoative perfects in Japanese. The past-eventive interpretation is just the other side of the coin of the resultative-state. That is, an eventive modifier is predicated of the 3rd dimensional VP in Japanese. The whole perfect sentence describes an event of falling in this case. (As before, I represent the modifier as ‘Mod (e)’ in 69):

69. $(t^R)(\exists e)(\exists s) [t^R \in \tau(e) [\text{Falling } (e) \ \& \ \text{Experiencer } (e, \text{ a man}) \ \& \ \text{Location } (e, \text{ floor}) \ \& \ \text{To } (e, \text{ floor}) \ \& \ \text{Being-Fallen } (s) \ \& \ \text{On } (e, \text{ floor}) \ \& \ \text{Theme } (s, \text{ a man}) \ \& \ \text{Terminater } (e, s) \ \& \ \textbf{Mod } (e)]]$

As readers will notice, the formula in 58 is *exactly* the same as 56, except that the modifier is now on the variable e, not on s. The structure is interpreted as past-eventive with the modifier predicated of the event e, as in 69.

I now turn to English inchoative perfects. English lexical inchoative verbs are taken out from the lexicon as a fully assembled ‘word’. However, the lexical verb amalgam needs to somehow participate in semantic interpretation somewhere within the lexical VP, in order to describe one eventuality with the rest of the constituents inside the lexical structure. The topmost node is the most appropriate site for this since any lexical verb is sure to stop there, because this structural position is associated with event-feature checking (see chapter 6 on this). Therefore I assume that, somehow, the lexical verb in English is interpreted as a ‘word’ at the highest

node of lexical structure, where it checks the event-feature: for the inchoative structure, this is the 3rd VP.

That amounts to saying that only the past-eventive interpretation is possible in English since only the topmost node, the 3rd VP constituent, is associated with the interpretation of the lexical verb at the CI component in lexical inchoatives. Since the highest node in inchoatives is the 3rd VP, and since the canonical interpretation assigned to the 3rd VP is eventive –at this level, basically, some form of Change– then English inchoative perfects are always interpreted as eventive. The semantic formula for this reading is identical to the one in 69. Through the same mechanism, though, only the highest node of the lexical structure ends up being ‘visible’ for time adverbial modification in a language like English. Thus the modification of durative adverbials, such as *for thirty minutes*, is interpreted as predicated solely of the whole inchoative eventuality in English inchoative perfects:

70. Bill has fallen on the floor for thirty minutes.

The example in 70 only has an iterative eventive reading wherein, somehow, Bill keeps falling onto the floor a multiple number of times, for thirty minutes.¹¹²

¹¹² Assumption 53b ensures that any structural position that an English lexical verb involves ‘on its way up’ to the topmost VP is actually dissociated from any extra semantic effect that requires syntactic transparency (i.e., the amalgamated lexical verb does not ‘reconstruct’ to its feature-checking positions inside lexical verb structures.).

Before I close this section, I present one more piece of evidence in support of the present analysis. Notice that I essentially claimed that the resultative-state interpretation is available in Japanese because *the ‘scattered’ lexical structure itself* manages to get interpreted at the CI component. The last piece of evidence I present to this effect revolves around the two classes of locative markers that are apparent in Japanese: eventive *-de* and stative *-ni*. I first would like describe these two locatives.

Locative phrases come in two varieties in Japanese, stative or eventive:

71a. Asoko-ni/*-de	kasa-ga	a-ru
there-at.State/at.Event	unmberella	be-NonPast

(An umbrella is there)

71b. Asoko-*ni/-de	paati-ga	a-ru
there-at.State/at.Event	party-nom	be NonPast

(A party will be there)

As 71 shows, the stative locative *-ni* shows up in a sentence with stative characteristics. It is felicitous only with non-event nominals (e.g. ‘umbrella’). Compare this to the eventive locative *-de* in 71b, possible only with eventive nominals (viz. ‘party’).

Interestingly, inchoative perfects with resultative-sate interpretation combine with either of the locatives, stative or eventive (72). The same is true for the past-eventive reading (73):

[Scenario: At the scene of a cycling race. Near a tent where the cyclists get water, towels, or fall to the ground to catch a breath, a man has been lying down for quite a while. A helper of the race, noticing that the man has been there for thirty minutes without even moving, says to his co-volunteer]:

72. Asoko-ni/-de hito-ga moo sansyuu-pun-mo
 there-at.State/at.Event man-nom already thirty-minute-Focus
 tao-re-te-i-ru node, mite-ki-masu
 fall-Inch.-TE-be-NonPast because see-come-polite

(Lit.: Because a man has fallen there already for thirty minutes, I'll check him out. [the verb describes 'a man lying there already for thirty minutes as a result of having fallen'.])

[Scenario: A detective is looking for a clue in a crime scene. He utters:]

73. Izen koko-ni/-de hito-ga tao-re-te-i-ru
 before there-at.State/at.Event man-nom fall-Inch.-TE-be-NonPast

(Lit.: A man has fallen here before [-describing that 'there was an event of a man's falling to, here.'].)

My proposal predicts the well-formedness of the examples in 72 and 73. If indeed the IC reads the lexical structure in Japanese, then the eventive locative on the 3rd VP should be also ‘visible’ to the CI, integrating it in the resultative-state interpretation. The same obtains for the past-eventive inchoative perfects.

In this section I proposed semantic formulas for the resultative-state reading and the past-eventive reading in English and Japanese inchoative perfects. This analysis is based on the contrasting methods of amalgamation of lexical verbs in English and Japanese, which lets the complex structure argued for in this thesis survive until LF in the latter language. Although it is an interesting issue why the structure doesn’t fully survive to LF in all languages, the fact that it does in some directly argues for its reality.

Conclusion.

In this chapter I have proposed, in effect, that the underlying syntactic structure for many verbs is unexpectedly bi-clausal. This bi-clausal structure may be disguised because of the way a lexical verb amalgamates into a word, and subsequent syntactic mechanisms. Specifically, I have argued that English verbs are introduced into syntax with the derivational verbal morphemes already attached, whereas Japanese selects derivational verb morphemes for a lexical verb directly from the lexicon, composes them into a ‘word’ only at PF. English thus employs a feature-checking mechanism for lexical verb amalgamation in syntax, whereas Japanese instead resorts

to a looser Agree mechanism. In the processes of presenting the data to support this claim, I proposed that lexical inchoatives have a much richer structure than is usually thought.

I have argued that derivational verb morphemes reach LF ‘scattered over’ the tree in Japanese, and thus in many respects they are interpreted at the position where they are first introduced into syntax. This results in a sort of transparency, specifically for the purposes of adverbial modification and ellipsis, that we are not accustomed to observing in a language like English. That said, I have also shown that the notion of ‘lexical integrity’ still obtains –albeit in a reduced sense– in Japanese, where we can directly observe canonicity restrictions that would make no sense otherwise. Part of the research that awaits future completion is what ‘lexical integrity’ means, then, if it is real enough to be observed even in a language that allows many of the sub-lexical processes that are inoperative in others, which is what invites a syntactic analysis to start with.

Another question arises, also, as to where exactly relevant positions are that the syntax can access for modification or ellipsis purposes. In the next chapter I propose specific syntactic positions for where both causative and inchoative derivational morphemes are first introduced into the lexical structure in Japanese.

Chapter 6: The Structure of Inchoatives and Causatives in Japanese.

The proposal in this thesis is that syntax cranks up structures according to a certain format, the topological induction, and the resulting structures essentially are forced into a certain interpretation. This chapter provides evidence for this tight connection between the syntactic architecture of the Dimensional Theory and the semantics side in the CI component(s). In the previous chapter I argued that Japanese takes out derivational verb morphemes bare and has them assembled into a word at the PF component. The derivational morphemes reach the LF separately, scattered over the tree, and are interpreted at their original position, where they are first merged into syntax. The obvious question then is what these ‘original positions’ are for each derivational morpheme. In this chapter I propose syntactic structures and derivations for lexical causative and inchoative verbs in Japanese, which involve sixteen inchoativizers and causativizers in total. The gist of my proposal is that syntax avails simple and systematic accounts for intricate formations of lexical verbs in Japanese. I assign specific structural positions to the causative and inchoative suffixes in a principled way, and discuss their derivations in the theoretical framework of the Dimensional Theory. This is possible precisely because each layer, or dimension of verb projection, is syntactically and semantically real in the verb structure proposed here.

I primarily dwell on Suga (1979)’s work on the semantics of inchoative and causative derivational morphemes in Japanese. I take what seem like major components (*-a*, *-e*, *-i*, *- ϕ* , *-o*) of Japanese derivational morphemes and discuss their

semantic contrasts. Given that the derivational verb morphemes are interpreted in-situ, the data serve as strong pieces of evidence for the first-merge positions of the morphemes in syntax. In exploring this possibility, I tie the morphemes' semantic contrasts to the canonical interpretations assigned to each order of dimensional complexities at the CI component: Stativity to the 2nd order of dimensional complexities, Change to the 3rd, Agentivity to the 4th, and Causation to the 5th. All data in this chapter are drawn from Japanese. The chapter is organized as follows. First, I present the causative and inchoative data. Then I summarize my proposal on the original structural positions of those verb suffixes to anticipate what is to come later (section 6.1). Second, I discuss two classes of verb suffixal morphemes (section 6.2). Third, I provide a rationale for each suffix's particular structural position based on semantic contrasts and morphemic orders. I also discuss derivations for each lexical verb suffix by taking up sub-parts of lexical verb structures. I show how the verb structures proposed here derive all sixteen verb suffixes in Japanese (sections 6.3 and 6.4). Lastly, I recast the semantic contrasts of the suffixes in terms of the topological syntax, solely involving properties of mental spaces (section 6.5). Brief concluding remarks follow.

6.1. The Data and Summary of the Main Idea.

Let's move directly into my proposal by first examining the facts.

6.1.1. The Data.

The data comprise nine inchoative and seven causative suffixes forming *lexical* causative or inchoative verbs in Japanese, as in 1 (Jacobsen 1992):

1a. Nine inchoative suffixes:

- ϕ	<i>hikkom-ϕ-(u)</i> ¹¹³	retread
- <i>ar</i>	<i>korog-ar-(u)</i>	fall, roll
- <i>e</i>	<i>korog-e-(ru)</i> ¹¹⁴	fall, roll
- <i>i</i>	<i>mit-i-(ru)</i>	fill in
- <i>or</i>	<i>nukum-or-(u)</i>	warm up
- <i>r</i>	<i>kabu-r-(u)</i>	wear, become covered
- <i>re</i>	<i>arawa-re-(ru)</i>	appear
- <i>ri</i>	<i>tar-i-(ru)</i>	become sufficient in quantity
- <i>are</i>	<i>toraw-are-(ru)</i>	become captured

1b. Seven causative suffixes:

- ϕ	<i>tok-ϕ-(u)</i>	disentangle
- <i>as</i>	<i>tok-as-(u)</i>	disentangle
- <i>e</i>	<i>tunag-e-(ru)</i>	connect
- <i>os</i>	<i>horob-os-(u)</i>	make extinct, as of species
- <i>s</i>	<i>kabu-s-(u)</i>	make wear, cover
- <i>se</i>	<i>ki-se-(ru)</i>	make wear, as of clothes
- <i>akas</i>	<i>sobiy-akas-(u)</i>	tower over

¹¹³ ‘- ϕ ’ represents a zero morpheme. I follow Jacobsen (1992) for the segmentation and identification of lexical verb morphemes. In his system, the *-u* at the end of verbs in 1 is a default vowel for verbs. Japanese verbs conjugate at least into seven forms: irrealis, conditionals, imperatives, continuous forms to predicates or nominals, etc. Each of these conjugated forms takes a particular ending. The *-u* ending in 1 is the one for the citation form of the verbal conjugation, called *shuushi*(final)-form.

¹¹⁴ The segment *-ru* consists of *-r-* and *-u*, which, again, can be considered as ‘default phonemes’. The *-u* is the citation form of the verb as in fn. 75. The *-r-* is an epenthetic phoneme. An affixation between two consecutive vowels is banned on verbs, and the *-r-* breaks up the concatenation of the vowel cluster whenever a verb construct ending in a vowel is suffixed by an affix beginning with a vowel. Roughly, *korog-e* is a verb stem *korog-* plus *-e*, thus ending in a vowel. This is to induce a phoneme *-u* for a citation verb form. Thus the *-r-*, an epenthetic phoneme, is to rescue the suffixation, breaking up the two consecutive vowels, *-e-* and *-u*. This epenthetic phoneme is not to be confused with the *r* in *-ar-*, *-or-*, or *-are-*, which is a part of the inchoative verb suffixes in Jacobsen (1992), not an epenthetic default vowel provided by the phonological system.

An obvious concern is whether all of these verb suffixes fit into the proposed verb structure in a principled way. It turns out that they do, actually rather meticulously, as it will be shown shortly.

I need to clarify restrictions I impose on my data in sections 3 and 4, where I discuss semantic contrasts of inchoative and causative suffixes in 1. In elucidating semantic differences among the verb morphemes, I draw examples from minimal pairs in Jacobsen (1992) and Suga (1979).¹¹⁵ I take only the minimal pairs that are synonyms, well-formed in exactly the same sentence in ‘citation’ conjugational form (syuusi-kei).¹¹⁶ These criteria are summarized as follows:

¹¹⁵ Jacobsen (1992)’s lexical verb list contains 308 Japanese verbs. This yields 31 inchoative and 39 causative minimal pairs. I add 14 inchoative and 10 causative minimal pairs from Suga (1979) which do not show up in Jacobsen. Suga hand-picks 27 inchoative and 22 causative minimal pairs from a dictionary, *Oobunsha Kokugo Ziten, Shintei-ban* (‘Dictionary of Japanese, new edition; published by Oobunsha Publishing Company’). In his paper, Suga discusses 20 inchoative and 18 causative minimal pairs involving *-e*, *-a*, *-∅*, which appear more than once in the dictionary. Suga does not impose the criterion in 2 for his minimal pairs. See Appendix 2 for a summary and examples of minimal pairs from Jacobsen (1992) and Suga (1979).

¹¹⁶ I use the past tense for all the examples I construct for ease of exposition, and to exclude irrelevant factors. This is because, for example, the present tense form of an eventive verb can denote (i) future, (ii) universal/habitual statements, or (iii) an on-the-scene-report.

2. Criteria for minimal pairs of derivational verb morphemes in section 3 and 4:

- (a) Well formed in *exactly* the same sentences.
- (b) Close relation, yielding synonymous interpretation for sentences the morphemes are used in.
- (c) Well formed in ‘syuusi-kei’ (‘citation form’).

Since I use these criteria throughout sections 3 and 4, listing a class of examples that are filtered out precisely through these criteria, I will elaborate on them a bit more. The data are based on Suga (1979), but modified to appropriately suit the present context:

3. Examples filtered out by the criteria for minimal pairs:

(a’) Not well-formed in *exactly* the same sentence: (filtered out by 2 (a)):

Neusu-ga koko-made tutaw-at/* ϕ -ta
news-nom here-until reach-Inch./Inch.-past

(The news reached here.)

(b’) Not forming a synonym: (filtered out by 2 (b)):

Doori-o ak-asi/*e-ta
moral-acc open-Caus./Caus.-past

(pro preached the moral.)

(c') Not well-formed in 'syuusi-kei' ('citation form'): (filtered out by 2 (c)):

Hiroshi-ga iki-o kir-asi/* ϕ -ta
-nom breath-acc pant.breath-Caus./Caus.-past

(Hiroshi panted for breath.)

Hiroshi-ga iki-o kir-asi/ ϕ -te hasit-te-ki-ta
-nom breath-acc pant.breath-Caus./Caus.-Cont. run-TE-come-past

(Hiroshi came running, panting for breath.)

In 3a', one of the morphemes in the would-be pair renders the construction ill-formed. The lexical verb with the causative morpheme *-as* in 3b' is interpreted as an idiom with the preceding nominal –the one with *- ϕ* is not. Although the pair in 3b' is well-formed in 'renyoo-kei' (continuative form of a predicate), one member of the would-be pair is ill-formed in the standard 'citation form'. Thus I take verb morphemes contrasted in those environments not to qualify as relevant data for my purposes. I pursue this strategy in order to keep the data in its cleanest form, and to remove any irrelevant factors that we don't know might be emerging in the lexicon, adding unwanted complexity.¹¹⁷ For example, I assume that if a lexical verb cannot be used in its most basic conjugation form, 'syuusi-kei' (the citation form), then the lexical verb has already gone through a certain amount of meaning shift as compared to the other member of the pair.

¹¹⁷ Again, readers are reminded that syntactic computation starts right from the lexical structure proposed here. In contrast, the 'lexicon' is a collection of objects that can feed into syntactic computation in my system. As such, the lexical structure proposed here is part of so-called 'narrow syntax'.

In the next subsection, I summarize my main claims in this chapter. This will hopefully serve as a reference point for readers.

6.1.2. Summary of the Proposals.

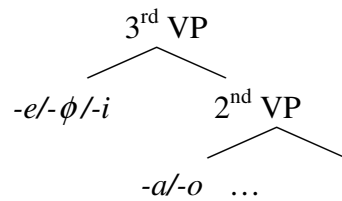
The main claims in this chapter on Japanese lexical verb structures pertain to: (a) sub-groups of verb suffixes; (b) particular syntactic positions of each verb suffix, and; (c) Aktionsart as interpreted in terms of spaces in the Dimensional Theory.

First and foremost, I further decompose the sixteen suffixes mentioned in 1 into eight basic morphemes, which I call *basic (verb) suffixes* or *basic (verb) morphemes*. They are $\{-e, -\phi, -i, -a, -o, -s, -r, -k\}$. These suffixes, in turn, are divided into two sub-groups. The first, $\{-e, -\phi, -i, -a, -o\}$, is ‘single-dimensional’: the morphemes in it expresses, each, a layer of dimensional eventuality. The second group, $\{-s, -r, -k\}$, is ‘multi-dimensional’, in that its members are a spell-out of chunks of eventualities, in a manner that I return to. I call suffixal morphemes in the former group *dimensional*, and the latter, *compositional*.

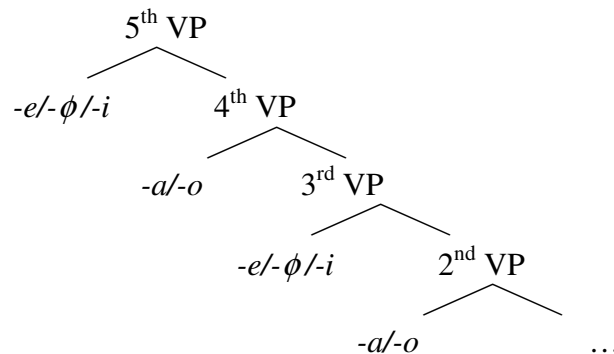
The basic structure for inchoative dimensional morphemes in Japanese is as in 2. For causatives, the structure in 4 ‘repeats itself’, as in 5:¹¹⁸

¹¹⁸ More precisely, the n^{th} dimensional VP in 4-7 represents the fact that a suffix is projected *within* the n^{th} dimensional VP. As this is immaterial to my purposes here, I alternate coding each dimensionality in ‘VP’ or ‘SC’ terms. I also switch to left-branching structures, simply for ease of exposition -order, however, is irrelevant.

4. Inchoative lexical verbs in Japanese with dimensional morphemes:

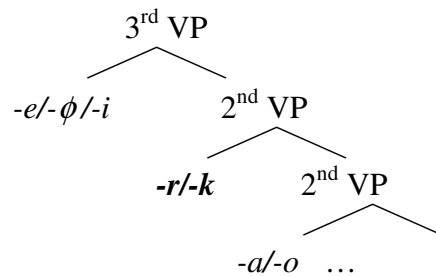


5. Causative lexical verbs in Japanese with dimensional morphemes:

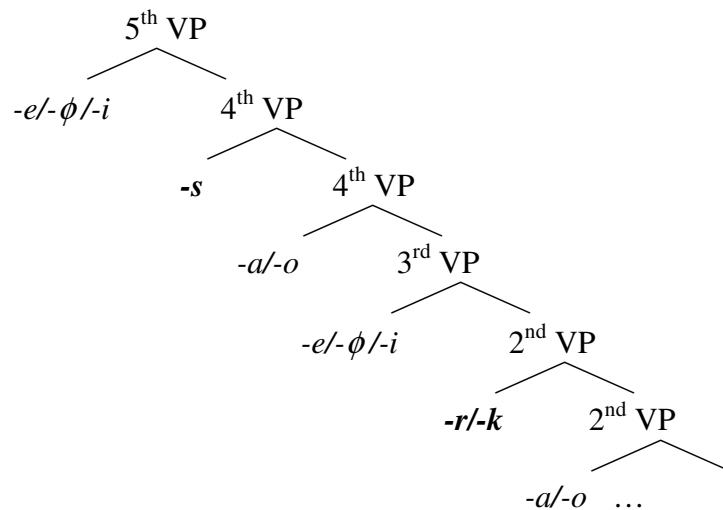


I add to those in 4 and 5 the compositional verb morphemes $\{-r, -s, -k\}$, to deal with larger ‘eventuality chunks’. For a reason that I return to below, the compositional verb morphemes are projected, adjoined by assumption, in the most embedded structure where more than one dimension obtains ($-r/k$ for the caused and $-s$ for the causing sub-event). In particular, the compositional morphemes are projected adjoined to the 2nd ($-r/k$) and 4th ($-s$) dimensions. The compositional suffixes are bold-faced in 4’ and 5’:

4'. Inchoative verbs in Japanese with dimensional and compositional morphemes:



5'. Causative verbs in Japanese with dimensional and compositional morphemes:



I draw the reader's attention, first, to the simplicity of the proposed structure. The lexical causative structure is basically a 'repetition' of the inchoative one. This also strongly supports the proposal in the previous chapters in that the lexical verb structure is 'bi-clausal'. Which 'clause' is involved is indicated by bold-faced compositional morphemes, in a manner that I return to. Notice also that the suffixes

of the same surface form code whether a space is unbounded or bounded: *-a* for the unbounded ones (the 2nd and 4th dimensional VPs), *-e*, *-i*, *-φ*, for the bounded ones (the 3rd and 5th dimensional VPs). In this sense, distribution of the suffixes directly mirrors the underlying topological architecture of lexical syntactic structures in 5. We will also see that this topological syntax is directly reflected on meaning differences of suffixes in terms of ‘topological semantics’ based on properties of spaces in section 4.

The structures in 4 and 5 will be employed in deriving lexical verbs in Japanese in the sections to follow. The rationale for the particular distribution of each suffix and its derivations are provided and explicated in the three sections to follow.

6.2. Inchoatives and Causatives with Dimensional and Compositional Morphemes.

Let’s now look at the data in more detail, from the refined perspective just introduced.

6.2.1. Basic Morphemes.

The analysis in this chapter relies on further decomposition of the sixteen verb suffixes we saw in 1 into eight *basic (verb) suffixes/morphemes*. Then those basic suffixes are classified into two sub-groups. In this subsection, I provide a rationale

for going in this direction based on the size (order) of the eventuality suffixes relate to, and provide a rationale for each group. First, I present the decomposition of the sixteen suffixes in 1, thus managing to group them into eight basic ones. Then I divide them into two further sub-groups in a principled fashion, just alluded to. Thirdly, I lay out the rationale for the positioning of compositional suffixes.

The first reason for singling out eight basic verb suffixes is simple: they are enough to obtain the sixteen inchoative and causative surface forms. For example, a causative suffix *-as* is an amalgam of two basic verb suffixes, *-a* and *-s*. So why posit more? This, however, works only if we can successfully amalgamate the elements into the attested lexical verb suffixes, which presupposes a precise syntactic positioning for each of the basic morphemes. The second reason for opting for the eight basic suffixes relates precisely to this. Given the structural positions of the basic morphemes that I provide below, that theoretical desideratum can be achieved.

As for the sub-grouping of the basic suffixes into two classes, I claim that this stems from ‘virtual conceptual necessity’. This is so when we pursue the intuition, alluded to in chapter 1, that the Dimensional Theory deploys a Kayne/Szabolsci-style ‘possessive’ syntax, of the sort Hornstein, Rosen and Uriagereka (1995) argue obtains for ‘part-whole’ relationship more generally. The question for us here concerns what is ‘part-whole’ in the semantics of eventualities as conceived in the language faculty. Intuitively, the interpretive component(s) of the theory must slice and identify ‘event layers’, and furthermore somehow compose them into a single, unified event. My

specific claim is that those tasks, the ‘slicing’ and ‘compositional’ aspects of interpretation, are notions that somehow correspond, respectively, to what I’m referring to as the dimensional and compositional suffixes in the verb projections, which is done explicitly in Japanese. In this regard, the Dimensional Theory provides us with ‘the right stuff’ for the two sub-groups because of its very architecture.¹¹⁹

In precisely that spirit, I propose to decompose the verb suffixes in 1 into the eight basic verb suffixes: *-e*, *-ϕ*, *-i*, *-a*, *-o*, *-s*, *-r*, *-k*. These suffixes divide themselves into two groups, depending on the size of the eventuality they associate with. The first group, namely, {*-e*, *-ϕ*, *-i*, *-a*, *-o*}, expresses *each* layer of dimensional eventuality, while the second, {*-s*, *-r*, *-k*}, acts instead as a composer of events –primarily ‘gluing’ the causing and caused eventualities together into a whole, in a manner I return to. The former group constitutes the dimensional suffixes, while the latter are what I think of as the compositional ones.

I now turn to the structural positions of the compositional suffixes. The primary difference between the two groups of basic suffixes is crucial in determining their structural configuration. I return to this point immediately below.

¹¹⁹ Conceptually, what I am doing here is not very different from what Muromatsu (1998) attempted with noun classifiers, for nominal dimensions. Like her, I argue that the basic layers in the Dimensional Theory are literally morphologized. Needless to say, then, in languages where this is not obvious we must invoke some parameter, which may be either semantic (a la Chierchia (1998)) or –more likely in my view– low-level in nature, essentially assuming that all languages have more or less the format that I propose below. I assume the latter position without discussion, essentially blaming it on variations on mere morphological realizations across languages.

6.2.2. Syntactic Positions of Compositional Suffixes.

Again, I am assuming that in order to conceive of an event, we first have to consider each relevant dimensional layer that the VP syntax provides, and then we must somehow combine the relevant eventualities into a single, unified event. The latter idea is common to several works, and it instantiates the intuition first pursued by Parsons (1990) that, whereas event decomposition is necessary to capture the nuances of natural language, the relevant multiple events still stand in a unique relation, as organized parts of a larger whole -they do not constitute merely loosely connected events.¹²⁰ The former idea can be seen, in the present light, as a way towards a unification provided already in syntactic architecture: crucially each lower dimension is a proper-part, in a perfectly direct way that requires no further stipulations, of the next dimension up, which is recursively generated from the lower space. I take the two classes of verb suffixes in Japanese understood as dimensional and compositional suffixes, to be essentially expressing each notion, by way of the regular apparatus of language: mere morphemes

¹²⁰ For instance, Pietroski and Uriagereka (2002) code the intuition in terms of their Assumptions One and Two, where the notion ‘accordion-style’ event clearly makes reference to some form of unification among the sub-events.

Assumption One: If an event x is the Terminator of an event e , then x ‘participates in’ e by virtue of being e ’s *final part*.

Assumption Two: the Theme of an accordion-style event e is the Theme of any Terminator of e .

I propose that the compositional suffixes project at adjoined positions, at what I think of as the ‘edge’ of the even, 2nd and 4th, dimensional VPs. The choice of the forms of suffixes from this group depends on which particular subevent suffixes mark on the verb, and specifically whether it is the ‘causing’ subevent –which associates to {-s}– or the caused subevent, which associates to {-r, -k} instead. This general choice, incidentally, is also seen in other classes of verb suffixes in this language, such as the passive morpheme *-rare* or the external causitimizer *-sase*. Notice that passive primarily affects the caused event part, absorbing the accusative Case. Thus I will note in passing that the choice to accomplish the relevant task is, not surprisingly, *-r* as in *-rare*. In contrast, the external causitimizer basically operates on the causing part of the event, adding an external Causer and demoting the original lexical causer to a dative subject. Thus the system opts for morpheme *-s* in this instance, as in *-sase*. Developing this matter here, however, would take me too far afield.

Of course the question arises next as to why it is precisely to the 2nd and 4th dimensions that the compositional suffixes associate. Again, these are obviously the even dimensions, which as I showed in chapter 1 are what establishes *open* spaces which the odd dimensions *bound*. In the Dimensional Theory –at least the way I have explored it in this thesis– what is common to the odd dimensions is that they emerge as a result of major operations on the open spaces of the even dimensions. From that perspective, it must be that the compositional suffixes are coding, precisely, this relation between a space and the operation that bounds it into something emergent (a mere end-point for the 3rd dimensional Achievements, an emergent end-state for the

5th dimensional Accomplishments). Of course, if this is the correct view of things, then it is clear that not all warps, in the sense of the Dimensional Theory, are ‘equal’. In a sense which I take to be unique to my own analysis, the dimensions ‘swing’. In my view, genuine warps, in the original sense Uriagereka (1995) gave to this notion, *only produce one new space*, at least in the case of the language faculty.¹²¹ How do I still get, then, the required *five* dimensions to have my Aktionsart work? Simply because my higher dimensions, as I noted in chapter 1, have a bi-clausal support to them, involving light verbs. That gives two more (hyper) spaces, as desired.¹²² In other words, the light verbs express a higher-ordered space on top of the 3rd VP, which emerges due to a property of the C_{hl} that I discuss in chapter 7, section 7.1.

Having provided a rationale for the syntactic positions for the compositional suffixes, and the choice of the actual surface forms, I now turn to the dimensional suffixes.

¹²¹ Mathematically nothing prevents the new space from warping yet again. That said, if what I am saying here is correct, in effect only one warp per conceptual space would be allowed by the system.

¹²² Needless to say, raising the issue of why the trick cannot be performed again, and again, etc. Recall also how I noted in chapter 1 that my proposal allows for more structural nuances than the one in Baker (2003), having five layers of VPs as opposed to a mere internal/external opposition. However, I too have a distinct ‘cut’ at the 3rd dimensional VP, and in that sense I also have only two major classes of syntactic objects in the lexical verb structure, one mono-clausal and one bi-clausal. I return to both of these points in chapter 7.

6.3. The Syntactic Positions of Inchoative Dimensional Suffixes.

The purpose of this and next section is to present empirical evidence for the syntactic positions of the inchoative and causative dimensional suffixes. As dimensional suffixes are catered to a single dimension each, I examine each inchoative and causative basic suffixes with the following criteria. Specifically, the empirical evidence for the positioning of verb suffixes is drawn from:

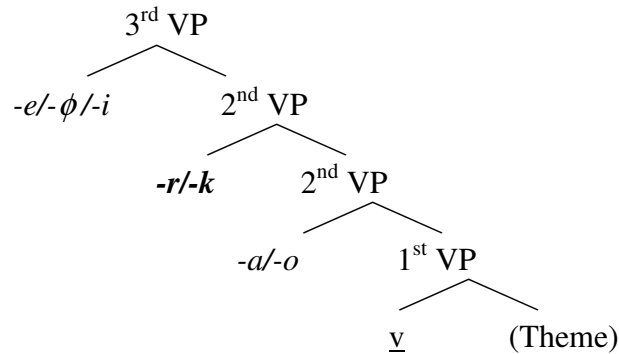
- 6a. The compatibility of verb suffixes with eventive and stative locatives; or
- 6b. ambiguities/acceptability involving adverbials; or
- 6c. minimal meaning differences observable in verb suffixes.

Minimal pairs are constructed to this end, as only they elucidate the minimal meaning differences of the contrasted morphemes.¹²³ Thus I compare the members of a minimal pair *in contrast to* each other.

Again, the nine inchoative suffixes for lexical inchoatives in Japanese are: *-ar*, *-or*, *-are*, *-e*, *-i*, *- ϕ* , *-re*, *-ri* and *-r*; they affix on verb stems and denote an inchoative event, as in *korog-ar* (stumble). As already discussed in section 1 above, I take these suffixes to organize in the way I repeat below:

¹²³ To recall, I require minimal pairs in this and next sections so as to conform to the criteria in 2 above.

7. Inchoative verbs in Japanese with dimensional and compositional suffixes:



I assume that if a suffix first-merges to an n^{th} dimensional VP then it somewhat ‘strengthens’ the interpretation canonically associated to that n^{th} dimension within the whole event. Thus, for example a suffix which first-merges in the 2^{nd} dimension in inchoatives carries the canonical interpretation for the 2^{nd} VP, the stativity, within the whole inchoative event. In contrast, a suffix that first-merges to the 3^{rd} dimension, for example, rejects the stativity; this is so since the 3^{rd} dimension is canonically interpreted as ‘eventive’. Also, as is evident in 4, I assume that the 1^{st} dimension is too simple to involve any verb affixes. In fact, it is the base dimension which the v stem first-merges to in syntax.

I would like now to overview my proposal on the inchoative morphemes by comparing it with that in Suga (1979). Suga proposes, in essence, a bona fide distinction between inchoative *-ar* and *-phi*, through elucidating subtle semantic contrasts between them. He characterizes the inchoative morpheme *-ar* as denoting a change which focuses on a resulting state of affairs, and *-phi* as describing the Theme’s movement. In other words, he proposes the relevant distinction to be change of state

vs. change of position. I agree with him in that there is a clear cut between *-ar* and *-ϕ* in the direction he proposes. I have, however, small additions and qualifications to comment on. I claim that inchoative *-e* is also eventive in minimal pairs with *-ar*, patterning with *-ϕ* –contra Suga, who proposes no principled distinction between these *-ar* and *-e*. Also, though I basically agree with him that the inchoative *-e* describes stativity in *e-ϕ* minimal pairs, I must add that this stativity is, in some sense, weaker than the one denoted by *-ar*.

With this much in mind, let us see the structural assignments of inchoative dimensional suffixes. To test the theoretical claim, I go through the tests in 6(a)-(c) above and assign structural positions to the dimensional suffixes that are ‘incorporated’ into the inchoative suffixes we just saw.

The data below suggest that there is a clear cut between *-e*, *-i*, *-ϕ* on one hand, and *-a*, *-o*, on the other. The latter group exhibits stativity. I demonstrate this by first contrasting *-ar* and other suffixes.

Let’s start by discussing minimal pairs involving *ar-ϕ*. The following examples show combinations of stative locatives and stative adverbials with *-ar* and *-ϕ* in the minimal pairs:

-ar vs. - ϕ :

8. Stative locatives:

Ebi-ga baketu-no soko-ni maruku tizim-??at/*? ϕ -ta
shrimp-nom bucket-gen bottom-on.State round shrink-Inch./Inch.-past
(The shrimp shrank round on the bottom of the bucket.)

9. Eventive locatives:

Ebi-ga baketu-no soko-de maruku tizim-at/ ϕ -ta
shrimp-nom bucket-gen bottom-at.Event round shrink-Inch./Inch.-past
(The shrimp shrank round at the bottom of the bucket.)

10. Kumo-no ito/tako-no asi-/-ga Masaru-no yubi-ni guru.guru-ni
spider-gen string/octopus-gen leg-nom -gen figner-to round-adv.
karam-ar/?? ϕ -ta
entangle-Inch./Inch.-past

(The web of a spider/legs of an octopus entangled to Masaru's finger, densely circling it.)

The example in 8 with *-ar* is more felicitous than *- ϕ* , with the stative locative *-ni*: the bottom of the bucket can be the location where stativity of the shrimps' being curled up round held. This reading is deviant with *- ϕ* when *-ni* is interpreted as 'location of stativity', as in 9. The same strangeness obtains with inchoative *- ϕ* with the adverbial *guru.guru-ni* (densely circling), which depicts the state of string on the finger in 10.

To sum up, *-ar* is ambiguous between a stative and an eventive interpretation, but *-ø* is only eventive.

Since the 2nd dimension is canonically interpreted as stative in the CI component(s), the data indicate that *-ar* originates in the 2nd dimensional VP, whereas *-ø*, instead, belongs in the 3rd dimensional VP.

Let's, next, contrast the affixes *-ar* and *-e*. The following examples again indicate that *-ar* belongs to the stativity dimension, whereas *-e*, instead, associates to the eventive one:

-ar vs. -e.

Stative locative:

11a. ?Hiroshi-ga miti-ni korog-ar-ta
 -nom road-at.State stumble-inch.-past
(Hiroshi laid on the road, by stumbling.)

11b. *?Hiroshi-ga miti-ni korog-e-ta
 -nom road-at.State stumble-inch.-past
(Hiroshi laid on the road, by stumbling.)

Stative adverbials:

12a. Hiroshi-ga miti-ni ??sizuka-ni/?*30 pun korog-ar-ta
-nom road-on quiet-ly/30 minutes stumble-inch.-past
(Hiroshi stumbled -and laid- onto the road quietly/30 minutes)

12b. Hiroshi-ga miti-ni *sizuka-ni/*30 pun korog-e-ta
-nom road-to quiet-ly/30 minutes stumble-inch.-past
(Intended reading: Hiroshi stumbled -and laid- on the road quietly/30 minutes)

13. Sonna tokoro-ni yoko-ni korog-ar/*?e-te-ina-i-de
here place-on flat-Adv. stumble-Inch./Inch.-TE-be-Neg.-Conjunction
sukosi-wa tesuda-i nasa-i
little-top assist-Continuous Imp.
(Don't just lay there, but make yourself useful a little.)

As in the translation of 11a, the directional/locative suffix *-ni* (to/on) is interpreted as a combination of the direction of the motion to which Hiroshi took a stumble, and the location where Hiroshi attains the resulting state. Thus Hiroshi stumbled *to* the road, and ended up laying *on* the road flat. In sharp contrast to this, *-ni* can only be interpreted as the mere direction of the motion in 11b. Therefore the *ni*- phrase modifies only the motion of Hiroshi's stumbling *to* the ground. In other words, the use of *-e* in 11b disambiguates the ambiguous locative/directional interpretation of *-ni* to be interpreted as a directional suffix, rather than a locative marker. This suggests

that *-ar* is both stative and eventive, whereas *-e* is only eventive. Likewise, the adverb *sizuka-ni* (quietly) in 12b is unambiguous: it can only express the way Hiroshi took a stumble. In contrast, the adverb in 12a is ambiguous. It can express the way Hiroshi took a stumble, on a par with 12b, or also the way Hiroshi lays on the ground –he laid on the ground quietly. Analogously, the durative adverbial *30 pun* (30 minutes) can describe the duration during which Hiroshi was lying on the road with *-ar* (12a). However, the same adverbial only expresses the duration of Hiroshi's repeated stumbling (=falling) to the road: Hiroshi repeatedly stumbled to the road for 30 minutes. This, again, support the assignment of *-ar* to the 2nd dimensional VP, and *-e*, to the 3rd dimensional VP. Likewise, *-ar* goes better with stative adverbial *flat* than *-e* does, as in 13.¹²⁴ These examples, again, support the structural assignment of *-ar* to the 2nd dimensional VP and *-e*, to the 3rd dimensional VP.

Now let us contrast *-ar* with *-i*. The same story goes to the *-a* and *-i* pairs. The *-ar* morpheme highlights stativity much more than *-i* does, as in 14:

¹²⁴ The verb appears in *renyoo-kei* (continuous form to predicates) in 13. So it is not a strict minimal pair in the sense in 2. But we have already seen that *korog-ar/e* does create a minimal pair in *syuusi-kei* (citation form). So I have added 13 to the data base.

***-i* vs. *-ar*.**

14a. Hiroshi-ga yorokobi-ni mit-ar/i-ta
 -nom joy-with fill-inch.-past

(Hiroshi filled with joy)

Stative adverbials:

14b. Hiroshi-ga nizyuu-pun sizuka-ni yorokobi-ni mit-ar/??ita
 -nom twenty-minutes quiet-adv. joy-with fill-inch.-past

(Hiroshi filled with joy)

15a. Popii-seedo-ga merikenko-ni yoku/kanzen-ni maz-ar/??-it-ta.
 poppy-seed-nom flour-to well/completely mix-Inch./-Inch.-past

(Poppy seeds mixed with the flour well/completely.)

15b. Aisukuleemu/abura-ga sumuuzii-ni ato.kata-no naku maz-at/??i-ta
 ice.cream/oil-nom smoothie-to trace-focus neg mix-Inch./Inch.-past

(Ice cream/oil mixed into a smoothie without a trace.)

Example 14a describes a stative-like situation. However, *-ar* describes how Hiroshi is indulged in joy as opposed to *-i*, in which joy is taken to flourish out from within Hiroshi. That is, *-i* expresses a state of affairs where the positive energy keeps generating inside Hiroshi. This (admittedly minimal) meaning difference is in accordance with the claim that *-ar* can express a stative situation –Hiroshi being more

passive when *-ar* is involved— as compared to *-i* in 14. Likewise, *-ar* is more felicitous with a stative adverbial as in 15. Thus I propose that *-ar* is first merged into the 2nd dimensional VP, and *-i*, to the 3rd one.

So far I have shown the contrast between *-ar* and other inchoative morphemes, proposing to assign *-ar* to the 2nd dimensional VP and *-ϕ*, *-i*, *-e* to the 3rd one. This is so since the 2nd dimensional VP canonically receives a stative interpretation at the CI, and the 3rd an eventive one.

Interestingly, minimal pairs created from the inchoatives *-e*, *-ϕ*, *-i* do not readily manifest their semantic contrasts, at least nowhere near as clearly as those manifested by the contrast between *-ar* and other morphemes. That is to say: the contrasting morphemes in the *e-i*, *i-ϕ* pairs below are hard to distinguish by the use of stative adverbials, stative locatives, and the like. In the following *e-ϕ* minimal pair, however, speakers report a strong hunch that the *-e* focuses more on the resulting stativity brought about by the leaking water, whereas *-ϕ* emphasizes the movement of water to the floor:^{125, 126}

¹²⁵ Suga exemplifies this movement-state contrast in the *e-ϕ* pairs:

- (i) Kimitu-ga teki-ni mor-**ϕ*/e-ru
 secret-nom enemy-at leak-Inch./Inch.-non.past
 (The secret leaks to the enemy.)
- (ii) Ha-ga sui-*ϕ*/*ke-te i-ru
 tooth-nom see.through-Inch./Inch.-TE be-non.past
 (Lit.: The teeth are see.through. [: with *ke*]
 The teeth have a gap in between. [: with *ϕ*])

-e vs. - ϕ

16. Mizu-ga koko-ni bisyo-bisyo-ni mor-e/- ϕ -ta
water-nom here-at wet.through-adv. leak-Inch./Inch.-past

(Water leaked here, saturating the place.)

-i vs. - ϕ

17. Tidoo hendoo niyori, atolantikku-ga ato.kata-mo naku
ground change because Atlantic-nom trace-focus neg

horob-i/ ϕ -ta

become.extinct-Inch./Inch.-past

(Because of the geological change, the Atlantic [country] became extinct deep in(to) the sea.)

(Suga 1979: 35, examples (34a, b) and (38a, b); the judgments are his)

I do not consider (i) and (ii) as data for this section. In (ii), the lexical verbs are not synonyms: the two are clearly related, but they do not have the same meaning (cf.: 2b). As for (i), the example with $-\phi$ is judged ill-formed even though the contrasted morphemes are in construction with exactly the same elements in the sentence, without any modifier (cf.: 2a).

¹²⁶ The following examples are equally well-formed:

(i) Ki-ga yumi-gata-ni sor-e/- ϕ -ta.
tree-nom bow-shape-in arch-Inch./Inch-past
(A tree arched into a bow shape.)

In (i), $-e$ and $-\phi$ both combine with the modifiers, which describe the shape that the tree ended up in by arching. I suggest that those modifiers are allowed by selectional properties of the lexical verbs.

Likewise, *-i* goes better with the stative adverbial than *-ϕ* does in 17, suggesting that *-i* is more on the stative side in the *i-ϕ* minimal pair.¹²⁷

To sum up, what we have seen is that one of the members always acts like *-ar* in *e-ϕ* and *i-ϕ* minimal pairs, in that it is capable of describing the resulting stative situation better than the other member does in combining with stative or locative modifiers. And it is always the *-ϕ* that gets to be more on the eventive side. This, in effect, is the result arrived at by Suga.¹²⁸ However, the eventive-stative distinction sensitive to grammatical elements such as stative or locative modifiers was shown to be much weaker in minimal pairs comprised of *-e*, *-i*, *-ϕ*.¹²⁹ Since Suga includes all lexical items that do not meet the criteria in 2, he does not discuss this particular difference between *-ar* on one hand and the *-e*, *-i* on the other.

There are two more issues that need to be addressed. First is why one of *-e*, *-i*, and *-ϕ* morphemes always gets to describe stativity better than the others in *e-ϕ* and *i-ϕ* minimal pairs, albeit to a lesser degree than *-ar* does. Notice that this is exactly what the semantic structure of inchoative verbs in chapter 5 expects (section 5.3). There

¹²⁷ Suga does not discuss the inchoative *-i* morpheme. He deals only with *-a*, *-e*, and *-ϕ*.

¹²⁸ He arrived at this conclusion by discussing semantic differences between minimal pairs, without the use of modifiers.

¹²⁹ It is not the case that *-e* and *-ϕ* morphemes do not show semantic contrast. Any native speaker feels the ‘resulting state description’ vs. ‘Theme’s movement’ contrast for the pair in 16, for example. It is just that this semantic contrast cannot be clearly pinned down through the use of stative adverbials or locatives, which *-ar* does.

Terminator crucially relates two eventualities in lexical inchoatives, an event \underline{e} and a state \underline{s} . It is no surprise then that this is the reflection of the basic making of spaces that the dimensional morphemes cater to in minimal pairs. In a sense, the dimensional morphemes code the architecture of spaces in the most economical way by distinguishing members of minimal pairs both minimally and maximally. It is a minimal distinction because these two classes of eventualities are all one needs to tease apart the internal makeup of an inchoative –the 2nd dimension and 3rd dimension. (I assume here that the 1st dimension is exceptional in that it is always a must for a verb, regardless of any of the considerations we are now entertaining.) Also the distinction is maximal given that there are only two eventualities to start with: If not an event, then a state. More simply put, there are only three dimensions in a lexical inchoative, and given that the 1st dimensional VP is always a must, the 2nd or the 3rd dimensions are the only keys in identifying and maximally distinguishing members of minimal pairs.

The next issue is how to assign the first-merge positions for the morphemes *-e* and *-i*. I propose that the $-\phi$ morpheme originates in the 3rd dimensional VP, the order of dimensional complexity that denotes an event, or Change. As for *-e* and *-i*, I propose to assign them to the 3rd order of dimensionality as well, on a par with the $-\phi$ morpheme. I present two sorts of evidence for this. The first is that *-e* and *-i* morphemes show genuine contrast in the minimal pairs with *-ar*. The second is that the stativity effect that *-e* and *-i* display is weak as compared to that manifested by *-ar*. This makes sense if *-e* and *-i* have a 3rd dimensional VP origin. However,

because of this, *-e* and *-i* cannot depict stativity as strongly as a bona fide 2nd dimensional VP morpheme like *-ar* does. Specifically, the stativity they describe cannot be easily pinned down by the use of grammatical elements such as stative modifiers. In other words, under the current analysis the weak stativity exemplified by *-e* and *-i* is actually predicted.

So far I have discussed the semantic contrast among *-ar*, *-e*, *-i*, $-\phi$ morphemes. I now present the contrast between *-e* and *-are* morphemes. The following example suggests that the latter is able to depict the resulting state more clearly than the former does:

18a. Kabe-no posutaa-ga tukue-no ue-ni hag-??e/are-ta
 wall-gen poster-nom desk-gen top-at peel.off-Inch./Inch.-past

(The poster on the wall peeled off on(to) the top of the table.)

18b. Kabe-no posutaa-ga biri-biri-ni hag-??e/are-ta
 wall-gen poster-nom torn.up-adv peel.off-Inch./Inch.-past

(The poster on the wall peeled off, torn into pieces.)

In 18, *-are* more felicitously describes the resulting state of the poster: namely, it's on the table, ending up in a torn state. This is in accordance with the analysis here under the assumption that the morpheme *-are* is composed of *-ar* and *-e*. Since it has *-ar*, it expresses the resulting state of change more felicitously than *-i*.

Finally, the following minimal pairs illustrate the contrast between *-ar* and *-or(e)* morphemes:

-ar vs. -or:

19. Karada-ga yoku nukum-at/ot-ta

body-nom well worm-Inch./Inch.-past

((My) body warmed up well.)

-ar vs. -ore:

20. Hiroshi-ga yuki-ni fukaku uzum-at/ore-ta

-nom snow-in deep bury-Inch./Inch.-past

(Lit.: Hiroshi buried deep in the snow. [=Hiroshi was deep in the snow as a result of burying himself into there.])

The morphemes *-or* and *-ore* go better with the stative modifiers than *-ar* does in 19 and 20. This means that *-or* wins over *-ar* in describing stativity in *ar-or(e)* minimal pairs. Recall that it is always *ar* that expresses ‘stronger stativity’ when *-ar* is in minimal pairs with *-e*, *-i*, and *- ϕ* . Applying the logic of positioning morphemes, this poses a question: Is there a position below *-a*, where *-o* is first-merged? Presumably the 1st dimensional VP, which denotes stativity at the CI. I must, however, leave this matter for future research for lack of minimal pairs comprised of *-or(e)* and a member

from *-e*, *-i*, or *-ϕ*^{130, 131}. Below I assume the first-merge position of *-or* to be the 2nd dimensional VP. This is so to the extent that the 1st dimensional VP does not involve any operation on a space, as assumed in chapter 1. I also return to this morpheme *-or* in section 5, where I re-cast the notion of ‘States’ in the topological syntax. There I indirectly argue that *-or* is first-merged to an open space, presumably the 2nd dimensional VP, based on contrasts between *-i* and *-or*. I should note, also, that if it turns out that *-or* has its origin in the 1st dimensional VP, it should not affect the validity of derivations for yielding attested inchoative morphemes in Japanese, as discussed below.¹³²

¹³⁰ The only relevant ‘minimal pair’ is *kom-or* (be filled) and *kom-ϕ* (be crowded, be intricate), as in Appendix 2. I do not consider these, however, as relevant minimal pairs in the light of (2b’): they are not synonymous, though they are clearly related.

¹³¹ I should also note in passing that *-or* expresses ‘change of state’, whereas *-ϕ* denotes ‘change of position’ in the *o-ϕ* ‘minimal pair’ mentioned in footnote 130:

(i) Hiroshi-ga heya-ni kom-ot-ta
 -nom room-in fill-Inch-past
 (Lit.: Hiroshi filled in the room. [=Hiroshi confined himself in the room.])

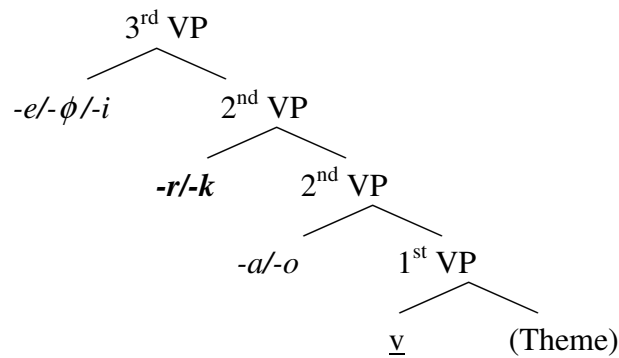
(ii) Heya-ga hito-de kon-ϕ-da
 room -nom human-with fill-Inch-past
 (Lit.: The room filled with people. [=The room got crowded with people.])

Suga would say that the example (ii) involves a change of position or movement of people, whereas (i) primarily describes a change of state in that Hiroshi ends up confined in the room. (I return to this ‘minimal pair’ in section 5 as well for this pair manifests defining characteristics of ‘swinging’ spaces in terms of the topological syntax.)

¹³² The remaining combinations of the inchoative morphemes, as well as three inchoative morphemes (*-r*, *-re*, *-ri*) are not treated in this thesis for lack of minimal pairs (even ignoring the stringent criteria in 2). See Appendix 2.

To sum up, I have proposed that the inchoative morpheme *-ar*, including the cluster *-ar* in *-are*, is first introduced into syntax at the 2nd order of dimensional complexities, and *-e*, *-i*, *-ϕ* at the 3rd. This is illustrated here as in 21. I included compositional suffixes *-r* and *-k* in the tree diagram as well (bold-faced):

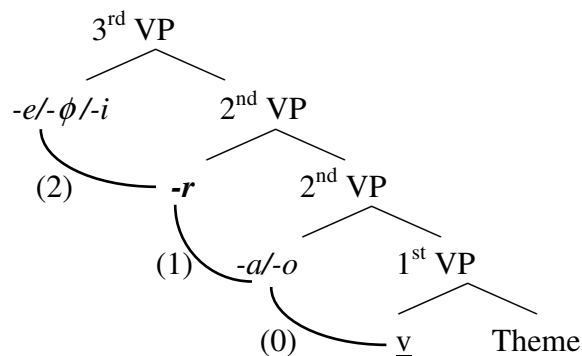
21. (=7) Inchoative lexical structures in Japanese with dimensional and compositional derivational morphemes:



As argued in the previous chapter, a derivational morpheme is taken in bare form out of the lexicon, and introduced to syntax into its unique, original position in the sort of lexical structures I have argued throughout this thesis. The scattered derivational morphemes feed PF, to be assembled into a ‘word’. On the other hand, they reach the CI component unassembled, yielding a string of semantic effects discussed in the previous chapter. I have just cleared up what those first-merge syntactic positions are for each of the inchoative dimensional morphemes.

Now that I have provided a rationale for the syntactic positions for the dimensional derivational morphemes in Japanese lexical inchoatives, I proceed to show possible assembly processes of the separate inchoative derivational morphemes at PF. I summarize the PF mergers in the tree diagram in 22, which derives all the nine inchoative suffixes. I will briefly go through relevant derivations immediately below. I do not assign specific nodes to the inchoative dimensional morphemes, other than the orders of dimensional complexities, as in 22. The purpose of this section is to demonstrate that the proposed structure in 22 is capable of deriving all the nine inchoative suffixes, sticking strictly to left-adjunction:

22.



By sticking strictly to ‘left-adjunction’ (as proposed in Kayne (1994) in a different, though compatible framework), the merger in (1) produces *-ar* and *-or*, hopping up. The merger in (2) is spelled out as *-re*, *-ri*, and *-rφ*. Combining paths (1) and (2), we can obtain *-are*. Adding *-e*, *-i*, and *-φ* we derive all the nine inchoative suffixes in Japanese. This does not, of course, explain why, for example, **-ari* is not attested as an inchoative suffix in Japanese, combining the movements in (1) and (2). However,

it does give principled derivations for all the existing inchoative suffixes in the language. The structure moreover makes a prediction. The possible inchoative suffix should not include a form like **-era*. But *-ore* is derivable by combining the paths (1) and (2) in 22. This indeed is the case. Jacobsen (1992) does not include *ore* in the inchoative morphemes in his list. However, as the presence of *ar-ore* minimal pairs, such as *uzum-ar/ore* (bury), indicates, *-ore* seems to be a bona fide inchoative dimensional morpheme in Japanese (Suga 1979). This actually makes *ten* attested inchoative derivational morphemes in total in Japanese. The point here is that all of them can be easily derived by the structure in 22. Moreover no inchoative morphemes can have a surface form that cannot be derived within the combinatory permitted in 22, again keeping it to the strict ‘left-adjunction’ that language seems to adhere to. (See also section 6.4 below for the status of lexical causitivizer *-kas*.)

My purpose here is to at least get the syntax right in that each derivational morpheme is assigned appropriate structural positions to feed into the morphological component. The assumption I adopt is that the morphological component opts to amalgamate morphemes in the simplest fashion, either hopping up or with no ‘movements’. But, crucially, with no hopping up-and-down, or skipping a morpheme over, or scrambling these elements. This is necessary for the orders of derivational morphemes within a lexical verb to come out right, as shown above.

In this section, I have discussed the specific orders of dimensional complexities that determine how inchoative derivational morphemes are first introduced into

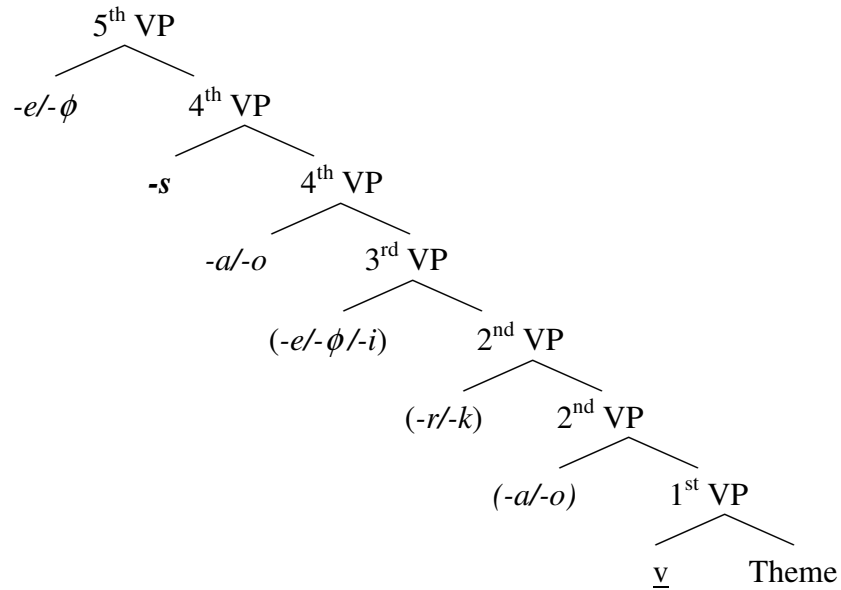
syntax. I also showed how derivations at the morphological component provide all the attested surface forms of the lexical inchoativizers in Japanese, and no unattested ones under reasonable assumptions. In the next section I discuss, in a similar vein as in previous pages, relevant structures and derivations for Japanese causatives with the dimensional morphemes.

6.4. Causative Derivational Morphemes: Structural Positions and Semantics.

There are seven suffixes for lexical causatives in Japanese; *-as*, *-os*, *-e*, *- ϕ* , *-s*, *-se*, and *-akas*. I take them to be syntactically based on the basic elements: *-a*, *-o*, *-e*, and *- ϕ* . (Notice that the *-i* form is missing from the list of the dimensional morphemes as a causativizer.) To remind the reader of the final syntactic positions I propose for causative dimensional suffixes, I repeat the proposed tree diagram below. I include the bold-faced causative compositional morpheme *-s* in bold-face, and the inchoative basic morphemes for completeness in 23:¹³³

¹³³ Some lexical causative suffixes, such as *-akas*, pick up overt dimensional morphemes both from the ‘causing’ part of an event (the 4-5th dimensional VP) and the ‘caused’ part (the 2-3rd dimensional VP). I include all the basic inchoative morphemes in 23 to illustrate this point in general.

23. Causative lexical structures in Japanese with dimensional and compositional morphemes:



As is evident in 23, the 4th and 5th dimensions are the ‘repetition’, so to speak, of the patterns exhibited by the previous inchoative dimensions.

Given this structure, I will first present a rationale for it. Next, I will proceed to briefly depict the derivations for each ‘transitivizer’.

As seen in 23, *-a/o* originate as 4th dimensional suffixes, whereas *-e/phi* are, instead, 5th dimensional ones. To recall, relevant interpretations associated to the presentations at these levels are Agency for the 4th dimension and Causation for the 5th. So naturally what I will examine is whether these particular readings are in any sense strengthened by the use of a given dimensional suffix, again considered in minimal pairs.

I start with the example in 24. Though strictly speaking 24 does not comply with the criteria in 2, the example serves as a good starting point for Causation-Agency analysis. First, let us contrast *-a* and *-e* for the causative use:

***-a* vs. *-e*:**

24a. Hiroshi-ga kodomo-o tat-asi-ta/*tat-e-ta
 -nom child-acc stand.up-caus.-past

(Hiroshi stood up the child.)

24b. Hiroshi-ga ita-o tat-asi-ta/tat-e-ta
 -nom board-acc stand.up-caus.-past

(Hiroshi stood up the board.)

As is seen in 24 the causitivizer *-as* is felicitous with the presence of an Agent-like object, *the child*. But the causitivizer *-e*, in turn, selects a non-Agent object, such as *the board*. When *-as* is used with a non-Agent like object, as in 24b, this implies that the ‘board’ is somehow standing on its own. This sharply contrasts with the behavior witnessed for *-e*, in that the relevant board in this instance is described as a passive object which, for example, solely leans against a wall to maintain its uprightness. In other words, an ‘Agency requirement’ is imposed on *-as*. In fact, all the lexical verbs denoting the events associated with the 4th VP (Activities) form a Verb Class, or a causative-inchoative alteration, solely with *-as*.¹³⁴ In light of this fact, I claim that

causitivizer *-as* assumes a position in the 4th dimensional VP, the canonical site for Agency; on the other hand I propose that *-e* is positioned, instead, associated to the 5th dimensional VP.

If indeed Agency is the notion that distinguishes the *-as* from the *-e* morpheme, then we expect adverbials that canonically modify Agents to go better with *-as* than with *-e* in minimal pairs that comply with the criteria in 2. The minimal pairs in 25 and 26 speak to this point, positively. I base them on Suga's examples:

25. Hiroshi-ga mae-o arui-te-iru-hito-o

-nom front-acc walk-TE-be-person-acc

wazato/sibusibu dok-asi/*e-ta

intentionally/reluctantly remove-Caus./Caus.-past

(Lit.: Hiroshi removed intentionally/reluctantly the person walking in front of him. [Intended interpretation: 'Hiroshi made the person walking in front of him move intentionally/reluctantly'.])

26. Mizu-ni sio-o kuwa-e-te, Hiroshi-ga suityuu-no tamago-o

water-to salt-acc add-Caus.-TE, -nom water.inside-gen egg-acc

onozu-kara/hiroride-ni ukab-?asi/*e-ta

self-from/by.itself-adv. remove-Caus./Caus.-past

(Lit.: By adding salt to water, Hiroshi floated the egg on its own/by itself)

(Suga 1979, 37-38, based on his (62), (69))

¹³⁴ This is so for all the 308 verbs in the list of fifteen Verb Classes in Jacobsen (1992).

As in 25, *-as* goes better with the adverbials *intentionally/reluctantly*, which modify the grammatical object that is involved in the event of removing. The same story goes for 26. Only *-as* can felicitously describe an egg as rising up on its own from the bottom of a glass to float. The latter example indicates that the grammatical object is interpreted as if it is capable of exploiting its own property to float, more like an Agent can. These examples make sense if *-as* originates in the 4th order of dimensional complexity, and thus demands the notion of Agency on the grammatical objects in 23-26. Contrarily, *-e* does not go well with an object with [+Agency] property in the minimal pairs. When it does, *-e* presents the grammatical object as if it is an object without Agency. This suggests that *-e* is first-merged at the 5th dimensional VP.¹³⁵

I now present the semantic contrast of the dimensional morphemes *-as* and *-ø*, as in 27:

¹³⁵ There might be a connection between elaborate action/efforts usually associated with the notion of Agency and the resulting change of state in a causative construction. That is, in general, elaborate action/efforts on the part of the Causer as an Agent makes it easier to bring about an equally elaborate result. Then Suga's proposal could be translated as one involving Agency as well. I have discussed the operational similarity between the 2nd and 4th dimensional order of complexity in the 'swinging' architecture of spaces within the topological syntax in chapter 1. In section 5, I return to this point.

-as vs. - ϕ :

27. Hiroshi-ga enogu-o hitoride-ni tok-?asi/* ϕ -ta

-nom paint-acc alone-adv dissolve-Caus./Caus-past

(Lit.: Hiroshi dissolved the paint on its own. (Intended reading: Hiroshi dissolved the paint such that it resolved on its own.))

28. Hiroshi-ga kitte/penki/kino-kawa-o hitoride-ni/onozu-kara

-nom stamp/paint/tree-bark-acc self-from/alone-adv

hag-?asi/* ϕ -ta

peel.off-Caus./Caus-past

(Lit.: Hiroshi peeled the stamp/paint/tree's bark on its own. [Intended reading:

Hiroshi peeled the stamp/paint/tree's bark such that it peels on its own.]

(Suga 1979, 39, based on his (81), (70)-(72))

As in 27, and 28, *-as* is more felicitous than *- ϕ* under the reading that the grammatical object dissolves or peels off on its own, on a par with the *as-e* minimal pairs. Thus I propose that *- ϕ* originates in the 5th dimensional VP, contrary to *-as*, which originates in the 4th one.

Let me now contrast *-e* and *- ϕ* for causatives, as in 29:

-e vs. *-ϕ*:

29. Hiroshi-ga booto-o hitoride-ni kisi-ni tunag-e??/**ϕ*-da

-nom boat-acc alone-adv. coast-to connect-Caus./Caus-past

(Lit.: Hiroshi connected the boat to the coast on its own. [Intended reading: Hiroshi connected the boat to the coast such that it connects to the coast on its own.])

[Suga 1979, 36, based on his (42)]

30. Hiroshi-ga kaisen-o hitoride-ni tunag-??e/??**ϕ*-da

-nom atamp-acc alone connect-Caus./Caus-past

(Lit.: Hiroshi connected the circuit on its own. [Intended reading: Hiroshi connected the circuit such that it connects on its own.])

[Scenario: Hiroshi is a movie director, Masaru, an actor. Hiroshi directs Masaru to purposefully jam himself between doors to catch the attention of a stranger nearby.]

31. Hiroshi-ga Masaru-o wazato doa-ni hasam-?*e/**ϕ*-ta

-nom -acc intentionally door-to jam-Caus./Caus.-past

(Lit.: Hiroshi jammed Masaru intentionally between the door. (Intended reading: Hiroshi made it such that Masaru intentionally jams himself between the door.)

Since *-e* goes with the adverbial better than *-ϕ* does, I must say that *-e* depicts Agency in the *e-ϕ* minimal pair in 29-31.

I have shown that $-\phi$ is always on the [-Agency] side. However, $-e$ varies its event description regarding the [Agency] factor, depending on which morpheme it forms a minimal pair with: [-Agency] with $-ar$, and [+Agency] with $-\phi$. Also the [+Agency] contrast that the $-e$ displays in $e-\phi$ minimal pairs is significantly to a lesser degree than $-ar$ does. I thus propose that both $-\phi$ and $-e$ are first-merged to the 5th order of dimensional complexity in lexical causative structures; in contrast to $-as$, which originates in the 4th dimensional VP. Recall that a similar situation held in inchoative dimensional morphemes as well in the previous section. There, inchoative $-ar$ is always on the [+Stativity] side, $-\phi$ [-Stativity], and $-e$ and $-i$ change their stative description according to the other member of the minimal pair; [-Stativity] with $-a$, and [+Stativity] with the rest. Also, $-e$ exhibits lesser degree of stativity when paired with $-\phi$, than $-ar$ does in $ar-\phi$ pairs. The causative basic morphemes, notably $-a$, $-e$, and $-\phi$, exhibit exactly the same pattern as to [Agency] factor. This is expected under the lexical verb structure I propose, where the higher 4th and 5th dimensional orders of spaces are the ‘repetition’ of the lower dimensions thanks to the underlying bi-clausal structure.^{136, 137}

¹³⁶ It is worth to briefly present a semantic contrast between $-s$ and $-se$. As in (i), the morphemes $-s$ and $-se$ maintain almost equal status for [+Agency], with $-se$ going slightly better with a relevant adverbial:

- (i) Hiroshi-ga futa-o hitoride-ni potto-ni kabu-??si ϕ /?(?)se-ta
 -nom id-acc alone-adv. pan-to cover-Caus./Caus.-past
 (Lit.: Hiroshi covered the lid to the pan on its own. [=put the lid on the pan such that the lid, on its own, comes to cover the pan.])

I thus suggest that $-s$ is made up of $-s$ and $-\phi$. Then the data in (i) receives a natural account: $-s\phi$ and $-se$ share exactly the same structure of the basic morphemes, both

To sum up, I have proposed that *-as* is introduced at the 4th order of dimensional complexity in lexical causative structures, contrary to *-e* and *-ø*, which originate at the 5th order of dimensional complexity. This is illustrated in 32, with inchoative and compositional basic morphemes:¹³⁸

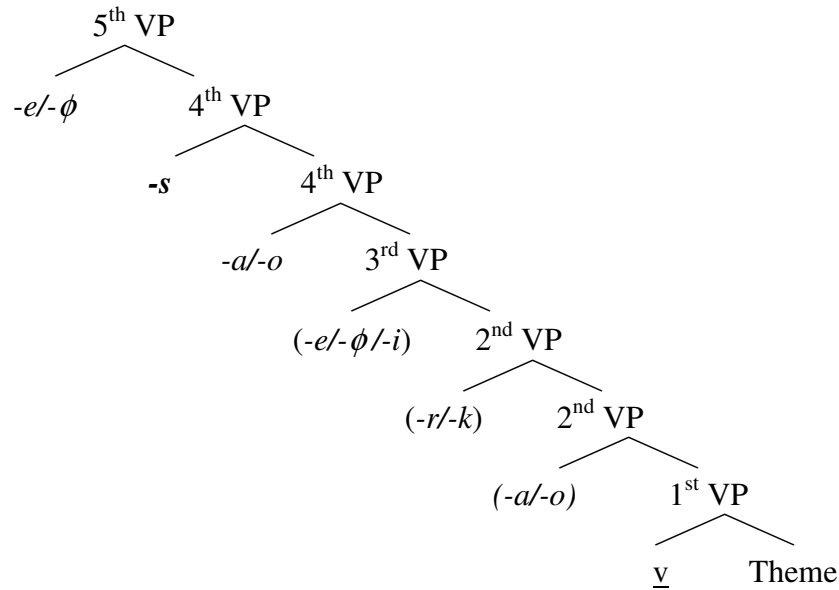
involving the 4th and 5th dimensional morphemes. Naturally, the contrast in seen in *ø*-*e* pairs carries over to *sø-se* pairs as well, which is the case.

¹³⁷ I cannot contrast the suffixes *-as* and *-os*. The only available *as-os* minimal pair, *hotob-as/os* (soak), is almost out of use today (see Appendix 3). Thus it is difficult to attain reliable grammatical judgments, unless drawn from certain dialects. *Shogakukan Progressive Japanese-English Dictionary 1986*, which lists 70,000 Japanese words, does not even contain these lexical causative verbs (nor their inchoative counter-part, *hotob-ir* (soak)).

The semantic contrasts for the rest of the combinations of causative dimensional morphemes are not discussed here for lack of minimal pairs, even without the criteria in 2. See Appendix 2.

¹³⁸ I assigned the inchoative morpheme *-o* to an open space, the 2nd dimensional complexity, in the previous section. I draw an analogy to this, and assign the causative morpheme *-o* to an open space, the 4th dimensional complexity, in 32.

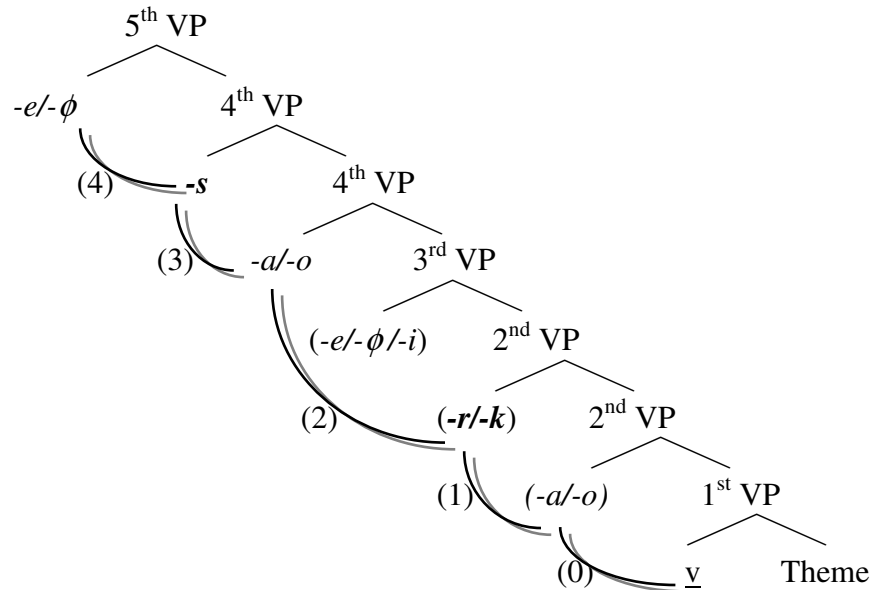
32. (=23) Causative dimensional morphemes in Japanese (with compositional and inchoative dimensional morphemes):



As proposed in chapter 5, the derivational basic morphemes reach the PF scattered over the tree. The mergers of those separate morphemes proceed as follows:¹³⁹

¹³⁹ The inchoative morphemes *-e*, *-phi*, *-i* at the 3rd dimensional VP are not involved in derivations of any lexical causative suffixes. I left them there to illustrate unattested but possible lexical causative suffixes in the most general fashion. Recall from chapter 5 that lexical verb suffixes are just a spell-out of orders of dimensional complexity. As such, the overt inchoative morphemes, *-e*, *-phi*, *-i*, do not have to be present at the 3rd dimensional VP for the purpose of derivations of lexical causative suffixes.

33. PF mergers of causative dimensional morphemes: [some derivations involve inchoative dimensional and compositional morphemes as well]:



In the strict terms of left-adjunction (Kayne (1994)), the mergers involving (3) derive appropriate mergers for *-as*, and *-os* onto the verb stem, hopping up. The merger in (4) involves the amalgamation of *-se* and *-sphi*. Combining mergers (1)-(3), we obtain *-akas*. Adding *-e* and *-phi*, we derive all seven attested lexical causative suffixes in Japanese.

Readers are reminded, again, that my purpose here is merely to demonstrate that all seven causative suffixes are derivable from the lexical verb structures with the proposed structural assignments of causative (and inchoative) derivational basic morphemes in 33. That is, I assume that the morphological component amalgamates derivational morphemes in the simplest way, with no ‘scrambling’ mergers, skipping over a couple of morphemes, and so on – as discussed in the previous section on

inchoative dimensional morphemes. This is necessary for the surface orders of the derivational verb suffixes to come out right in Japanese with the proposed structure.

How exactly these mergers take place at the PF side, at the morphological component, is actually beyond the scope of the present thesis. I must add, however, that just like the inchoatives structure, the proposed lexical causative structure delimits the range of possible surface forms of lexical causative morphemes in the verb domain in Japanese. For, example, we never see a form like **-aksa* as a causative derivational suffix. But we may see a form like *-kas* in Japanese. Jacobsen (1992) does not include this form in his list of lexical ‘causativizers’. However, this surface form is attested as a lexical causative suffix, as observed in Suga (1979):¹⁴⁰

34a. Masaru-ga ne-ta
 -nom sleep-Caus.-past

(Masaru slept.)

34b. Hiroshi-ga Masaru-o ne-kasi-ta
 -nom -acc sleep-Caus.-past

(Lit.: Hiroshi slept Masaru. (=Hiroshi made Masaru sleep.))

¹⁴⁰ This makes eight causative surface forms attested in Japanese. Incidentally, according to Jacobsen’s segmentation of morphemes, *nigoras-nigos* (muddle) minimal pair is segmented into the verb stem *nigo-* (muddle) plus the ‘causativizers’ *-ras* or *-s*. The new lexical causative suffix *-ras* in this minimal pair can be easily derived by the lexical structure in 33 as well.

6.5. Space Talk: Semantics of Basic Morphemes in the Topological Syntax.

In the previous sections I argued for specific positions for the dimensional morphemes where they are first merged in syntax. There, I crucially utilized the ‘canonical’ interpretations that each order of dimensional complexity is assumed to receive at the CI component: States, Change, Agency, etc. In this section, I characterize those notions in term of properties of spaces. Specifically, I argue that the ‘expansion’ of spaces is involved in the 2nd and 4th dimensions, while bounding determines the 3rd and 5th ones, as discussed at the outset of this thesis (see chapter 2). Those structures are then fed into the CI component, to be assigned a matching interpretation. The purpose of this section is to bring in evidence in support of this topological take on Aktionsart.

I first present my proposal, translating States, Activities, etc., into the topological syntax: the expansion and bounding of spaces (Section 6.5.1). Then I illustrate how this proposal sheds light on otherwise merely descriptive generalizations on the interpretation of derivational morphemes in Japanese. Relevant examples point to a connection between the two operations in spaces. I bring in rarely-occurring minimal pairs that can only receive a natural account in the topological take on Aktionsart (sections 6.5.2.) A brief conclusion follows. In this section, incidentally, data discussed are not confined to those permitted by the constraints in 2. I draw examples from Suga (1979) and quote him in the description of eventualities in his examples.

In a sense, data in this section is just a re-arrangement of Suga's, to illustrate the topological characterizations of eventualities in Japanese.

6.5.1. Proposal: Operations on Spaces in the Topological Syntax.

In characterizing orders of dimensionalities, I used notions such as States and Agency, which are the derivatives of traditional Aktionsart. In this section, however I propose to characterize what I take to be orders of dimensional complexity by the operations in the topological syntax. This is theoretically more desirable in that, especially on my take on things, it involves only two notions: the expansion and bounding of spaces. It is also empirically fruitful as will be seen below.

To recall, the two basic operations I assume in the topological syntax are the expansions and boundings of spaces. I assume the following topological mechanism as in chapter 1: the 1st order of dimensionality is the Base of the system –so nothing much happens there. The 2nd order of dimensionality takes the space of the 1st VP, then expands it, by adding, hence stretching, its confines. The 3rd order of dimensionality takes this space created by the 2nd VP, and bounds its expansion, by setting a limit and confining it. The 4th order of dimensionality again expands the space created by the 3rd VP by multiplying its units, thus stretching it. The 5th order of dimensionality again bounds this expansion.

As readers can see, there are only two operations on spaces, understood as compact sets of relations. The operations, however, have a notable by-product. A

space that expands ends up creating identifiable parts *within the same dimensionality*, in that space. This means an eventuality with identifiable multiple units within itself at the CI. On the other hand, a bounding space excludes such a possibility. The sole purpose of bounding is to create one delimited object as if all sub-spaces were welded into one single, unique space: In effect an emergent entity.

In what follows, I present data that illustrate the two space operations. Crucially, I show that the morphemes of unbounded spaces –the 2nd and 4th ones– exhibit what seems to be the semantic equivalent of the expansion, whereas the morphemes of bounded spaces, the 3rd and 5th ones, display the semantic likeness of the bounding. Below, I present minimal pairs of derivational morphemes to these effects.

6.5.2. Aktionsart in the Topological Syntax.

As the following examples strongly indicate, the expansion can be accomplished by: (a) the expansion of eventualities, coded in Themes (‘expansions’), and (b) the addition of mini eventualities within the main eventuality (‘addition’).¹⁴¹ On the other hand, the bounding describes; (c) eventualities that are bound or confined within a given space, as coded in Themes (‘bounding’), and; (d) the separation of a continuous eventuality into smaller units (‘separation’). Not surprisingly in my terms, much of those semantic effects are coded in the Themes, as they are a must for

¹⁴¹ Below I show that (a) and (b) are two separate manifestations of expanding spaces.

the Base in the lexical verb structure. I first present cases where stretching (expansion) and confinement (bounding) of spaces are exemplified:

-as vs. -e:

nob (stretch):

35a. Gaikoku-ni soosa-no te-o nob-as/e-ru
 overseas-to search-gen hand-acc stretch-Caus./Caus-pres.
 (pro stretched the hand of search to overseas.)

35b. Nanmin-ni kyuusai-no te-o nob-as/e-ru
 refugee-to rescue-gen hand-acc stretch-Caus./Caus-pres.
 (pro stretched the hand of rescue to the refugees.)

36. Makimono-o/yoka-o nob-*as/e-ru
 scroll-acc/floor-o stretch-Caus./Caus-pres.
 (Lit.: pro stretches the scroll/floor. (=spreads the scroll/bedding.))

37. Sainoo-o/basu-no rosen-o nob-as/*e-ru
 talent-acc/bus-gen route-acc Caus./Caus-pres.
 (Lit.: pro stretches the talent/bus' route. (=develops/extend))
 (Suga 1979: 37, based on his (52)-(56))

The contrast in 35-37 with *nob-* (stretch) can be characterized in terms of unbounded or bounded spaces. The morpheme *-as* expands a space, whereas *-e* works within a

given space. In general ‘*nob-e*’ stretches the Theme into its original size, whereas ‘*nob-as*’ changes the Theme into a stretched state (Suga 1979: 37). Thus, with *-as* the actor is taken to basically expand the space of search (viz., her ‘hand’) to overseas and the criminal is thought to be out of the immediate search space (35a). But with *e* the actor works within a given space and the ‘refugee’ is considered to be within the reach of someone’s hands (35b) (Suga 1979: 37). Likewise, the Theme in 37 expands its size/capacity further than its original size with *-as*, whereas the Theme in 38 involves its original length with *-e*. Notice that, as predicted, these stretching spaces only go with the morphemes first-merged to the open space, the 4th order of dimensional complexity with *-as*, whereas the closed space, the 5th order with *-e*, bounds that space. Here is another example:

38. Hiroshi-ga tetu-no boo-o nob-asi/e-ta
 -nom iron-gen bar-acc stretch-Caus./Caus-past
 (Lit.: Hiroshi stretched the iron bar. (stretch the iron bar/stretch the iron bar flat))

The morpheme *-as* describes an event wherein the welder Hiroshi extends the length of the iron bar further. In contrast, with *-e* Hiroshi is taken to work to flatten the iron bar: thus stretching the length of the bar is totally irrelevant. In other words, the former morpheme achieves the expansion of its space, whereas the latter operates inside a space of its own, on the Theme space.

The examples in 39 constitute another instance of the expansion of space, multiplying, which involves *-ar*, the 2nd dimensional morpheme:

-ar vs. -e:

korog- (fall):

39. Booruga korog-at/???e-te-ki-ta

ball-nom fall-Inch./Inch.-TE-come-past

(Lit.: The ball came falling. (=came bouncing to my direction.))

(Suga 1979, 40. His (86). Grammatical judgments are mine.)

The event in 39, associated with the morpheme *-ar*, denotes a series of bouncings of the ball; by contrast in *-e*, which describes only the first occurrence of the ball's bouncing, the subsequent motions are irrelevant. This, I propose, is an instance of space addition. Notice that this additive effect is only seen with the morpheme *-ar*, not with *-e*. Given that *-ar* originates at the 2nd dimensional VP, this receives a natural account in the current proposal.

Likewise, the semantic equivalents of the bounding and multiplying operations are clearly manifested in the following examples:

-as vs. - ϕ

kir- (cut):

40a. Kami-o hasami-de kir-**as*/ ϕ -ru

paper-acc scissors-with cut-Caus./Caus.-pres.

(pro cut the paper with scissors.)

40b. Denwa-o kir-**as*/ ϕ -ru

telephone-acc cut-Caus./Caus.-pres.

(pro hang up the telephone.)

(Suga 1979: 39, his (73) and (74))

The expression *kir-* (cut) with a $-\phi$ morpheme describes an event wherein ‘one continuous entity’ is separated by an actor (Suga *ibid*, 39). This is reminiscent of the bounding discussed above, which sets a limit to an expanding, continuous space. Notice that $-\phi$ associates to the 5th dimensional order. Thus it makes sense that the lexical structure in 40 always surfaces with the choice of the morpheme $-\phi$, never with *-as*.

Compare 40 to 41. Here, the choice of the dimensional morpheme is *-as*, not $-\phi$, in the following *as*- ϕ minimal pair (Suga 1979):

kir- (cut):

41a. Hiroshi-ga iki-o kir-asi/* ϕ -te hasit-te-ki-ta
-nom breath-acc pang.breath-Caus./Caus.-Cont. run-TE-come-past

(Hiroshi came running ,panging for breath.)

[(Suga 1979: 39), his (76), the judgement being his too]

41b. Hiroshi-ga iki-o kir-asi/* ϕ -ta.
-nom breath-acc pant.breath-Caus./Caus.-past

(Hiroshi panted for breath.)

[(Suga 1979: 39), based on his (76), the judgement being mine]

As in the gloss in 41b, *kir-as* in this particular combination indicates a repetitive catching of breath. In other words, Hiroshi actively breathes in and out multiple number of times, panting for air. This is much like a series of *kir-* (cutting) steps. In sharp contrast to this, *kir- ϕ* in 41b –if it means anything at all– expresses the idea that Hiroshi takes a breath only once, and then possibly holds it. As such, it is a peculiar use of *kir- ϕ* . Notice that 41b with *kir- ϕ* is normally judged ill-formed, as it clearly is a novel sentence that is not actually used. Nevertheless, any native speaker of Japanese can describe a situation wherein 41b makes sense with *kir- ϕ* : a breathing, only once(, and then possibly holding it). This, I suggest, is indicative that the expansion and bounding are the two hard-wired operations that we deploy in creating syntactic spaces, regardless of whether a common meaning can be ascribed to the resulting expression.

The expanding and bounding that I am interested in are both exemplified in 42-44:

-ar vs. - ϕ

tum- (close up)

42. Ami-no me-no tun-at/ ϕ -ta furui
net-gen mesh-gen close-Caus./Caus.-pres. sieve

(Lit.: A sieve with close meshes (=finely-meshed sieve).)

43. Gesui.kan-ga gomi-de tum-ar/* ϕ -u
sewage.pipe-nom garbage-with close-Caus./Caus.-pres.

(Lit.: A drain pipe closed with garbage (=clogged with garbage.))

44. Moku.me-ga tum-*ar/ ϕ -te-i-ru
wood.grain-nom close-Caus./Caus.-TE-be-pres.

(The grain of the wood is close (=fine).)

(Suga ibid, 34, his (17, 18, 20))

In 42-44, the morpheme *-ar* with the verb stem *tum-* describes an event wherein the spaces between Themes get filled by something. In contrast, with *-e*, the spaces between entities ‘become closer’, as if the overall space were to shrink in some sense. Suga puts the matter as follows: *tum-ar* describes a state of ‘fullness by something getting into the spaces’ between the entities that constitute a space. In contrast, *tum-* with *- ϕ* denotes an event wherein ‘the entities that forms a space move tightly closer’

(Suga *ibid*, 34). This, I suggest, is an instance of the expansion and bounding described by the 2nd dimensional *-ar* and the 3rd dimensional *-e*. The same line of reasoning goes for the following *or-ϕ* minimal pair:

-or vs. -ϕ

kom- (fill):

45a. Heya-ni kemuri-ga kom-ot-ta
room-in smoke-nom fill-Inch.-past

(The smoke filled the room.)

45b. Heya-ga hito-de kon-ϕ-da
room-nom human-with be.crowded-Inch.-past

(Lit.: The room filled with people. [=The room became crowded with people.])

The smoke fills the space in the room with *-or* in 45a. In contrast, the space in between the people in a room gets smaller by the increasing number of people in 45b.

Lastly, I present a minimal pair that seems to receive the most natural account in the topological syntax. In the following example, what distinguish the *or-i* morphemes in the *or-i* minimal pair is whether or not the Theme has multi-parts to it:

-or vs. -i:

ok- (occur):

46. Kono mati-ni fukuzatu-na koto-ga ?ok-i/(?)ot-ta

this town-dat complex-adj. thing-nom happen-Inch./Inch.-past

(A complex case happened to this town.)

Notice that the verb ‘occur/happen’ in 46 describes the mere attainment of an event, nothing more. Morpheme *-or* associates each instantiation of a Theme with parts, whereas *-i* does not. The example in 46 makes sense if indeed *-or* is first-merged as a 2nd dimensional morpheme.¹⁴²

In this section I presented data that imply elementary operations on spaces, expansion and bounding. In my terms, the eventualities canonically associated to the 2nd and 4th dimensional VPs, States and Activities, are a manifestation of the expanding spaces. In contrast, those canonically associated to the 3rd and 5th dimensional VPs, Achievements and Accomplishments, mirror the bounded spaces. This idea is entirely novel to this thesis, even if it is compatible with the Dimensional Theory as a framework.

¹⁴² In the previous section I assigned *-or* to the 2nd order of dimensional complexity without argument.

Conclusion.

In this chapter I discussed the specific orders of dimensional complexity that each basic morpheme is derivationally introduced as. To sum up, two classes of basic morphemes are identified in this thesis: compositional and dimensional ones. The former ‘glue’ multiple orders of dimensionalities together, whereas the latter characterize each order of dimensional complexity. Specifically, the compositional morphemes *-r* and *-s* are each positioned highest, adjoined to the 2nd and 4th dimensional VPs in order to code major operations on open spaces. The dimensional basic morphemes, *-a* and *-o*, are both assigned to an open space, the 2nd and 4th order of dimensional complexity for inchoative and causative eventualities. Morphemes *-e*, *-i*, and *-ϕ* all originate in syntax at the closed spaces, the 3rd and 5th order of dimensional complexity. I demonstrated that the surface forms of all attested sixteen verb suffixes in Japanese are derivable with these structural assignments of the morphemes –given standard derivational procedures. Lastly, I presented my own topological take on the Aktionsart, relying on two operations on spaces: *expansion* and *bounding*. It is whether a space is open or closed that characterizes States, Activities, etc. This attempts to derive Aktionsart specifications solely from their syntax, attributing the semantic nuances to the properties directly and naturally based on direct structurings of C_{hl}.

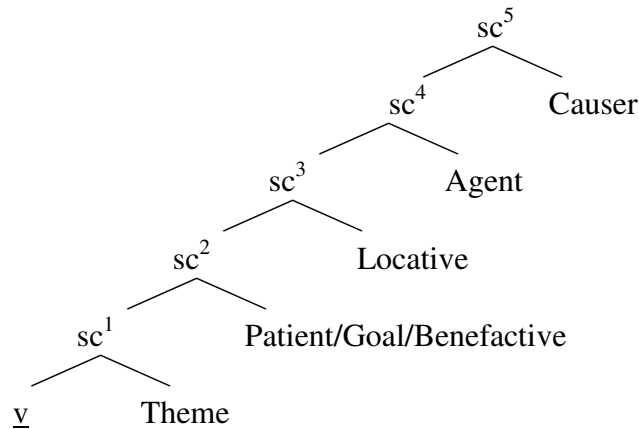
Chapter 7: A Speculation and Several Open Questions.

In this Chapter, I first discuss two issues left unaddressed in my proposal in the previous chapters. They pertain to the overall structure of the lexical verb: (a) the maximal order of dimensionality it can present, and (2) the maximal number of abstract Cases that can exist per verbal domain. One ought to seek to derive relevant conditions from the properties of the C_{hl} itself. My purpose in this chapter is to present the speculation that rather simple properties revolving around C_{hl} can conspire to determine some of the basics of lexical structures (section 7.1). Then, I compare Mark Baker's proposal in (2003) and my own, as they are closely related, and yet they also differ in significant ways (Section 7.2). I finally sum up with what I take to be new in this dissertation (section 7.3), which moves me to some brief concluding remarks (section 7.4).

7.1. On the Upper Limit of Dimensions and Abstract Cases.

I have proposed that the 5th order of dimensional complexity is the highest that a lexical verb can warp to. The relevant lexical structure is repeated here for readers' convenience:

1.



The question is: Why does it have to be this way? No obvious principle excludes the possibility that Spaces keep warping to any order of dimensional complexities in the Dimensional Theory, just as they surely do in the corresponding topologies within the number system (from real to complex to hyper-complex numbers, and so on). I tie this question to another obvious puzzle: If indeed up to five syntactic arguments figure in a lexical verb structure, as in 1, then why do only two of them show up with abstract Cases?¹⁴³ Why not, say, *all* five arguments each bear a different abstract Case?

¹⁴³ I assume that abstract Cases include only abstract accusative and nominative Cases (or ergative and absolutive in a different parametric setting, with essentially the same opposition of Case values). I take dative, oblique, genitive and similar Cases to be either inherent or assigned by some mechanism other than the one that is associated with the two core abstract Cases. I also assume that whether or not a simple sentence ends up with two or one abstract Case is determined *within the domain of a lexical verbal structure*, including functional projections related to it (for ideas along these lines, see also Uriagereka (2002: chapter 8)).

7.1.1. Why Dimensions Stop Warping.

The C_{hl} creates syntactic structures, and then the resulting structure is sent to the CI component(s) to be interpreted; we assume things not to be the other way around. Hence the reason why a maximum of five dimensions exists per lexical verb has to be purely syntactic: lexical semantics or any meaning component has no say in computationally restricting what syntax does. If so the issue is what inherent property of C_{hl} has as a consequence that an upper limit emerges on the number of dimensions deployed in natural languages.

In explicating this matter, first I adopt the following assumptions as properties of C_{hl} :

2. Assumptions:

- a. C_{hl} does not include a counter.
- b. C_{hl} codes the complexity of subsequent (subjacent) spaces via a (2nd order) symbol.
- c. The Base of the topological induction is special in a sense to be discussed.

Assumption 2a is uncontroversial (see Chomsky 1980). I suggest that assumption 2b stems from economy considerations: As a symbolic system, C_{hl} codes whatever is legible as soon as it is constructed through some representational mechanism –that is, a symbol. Since the grammar has no way of counting, this representational mechanism targets subsequent spaces –much in the way the Subjacency condition

cares about subsequent or subjacent ‘bounding nodes’. Assumption 3 draws its plausible justification from the architecture of the topological induction itself. The Base is special in any induction in that everything else ultimately relies on this Base.

The followings is arguably why, with all of that taken for granted, warping stops at the 5th order of complexity in a lexical verb structure:

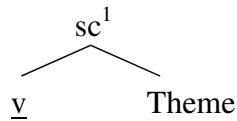
3. Reasoning:

- a. The 2D VP is warped on the Base. No structural coding happens at this point (by 2c).
- b. The 2D VP is warped onto the 3rd. At this point, C_{hl} codes this representationally, for there are two subjacent Spaces created by warps (by 2a, b).
- c. As a result of (b), the overall structure has one symbol coding the Space complexities.
- d. The 4D VP is warped, and from it the 5th. At this point, C_{hl} representationally codes these two (hyper) Spaces, for they are the subjacently created by warps (by 2a, b).
- e. As a result of (d), the overall structure has now used *two* symbols that C_{hl} employs to code the relevant structural complexities. Again, as the grammar has no counter, C_{hl} stops warping,¹⁴⁴ with two derivationally created symbols coded consecutively.¹⁴⁵

- f. Conclusion: We have involved two (2nd order) symbols, each coding two Spaces, plus the Base. This makes a total of five identifiable Spaces. Thus the most complex order of dimensional complexities that can be warped to in this system is the 5th one.

Let's imagine the warping mechanism from scratch. First, there's the Base:

4.

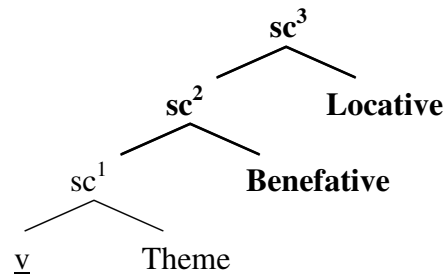


Warping this Base twice creates a syntactic object with three dimensions in total. We do this by relating the Presentations, or syntactic arguments, to the existing dimensions, as discussed in previous chapters. Newly warped dimensions are in bold in 5:

¹⁴⁴ As for the upper dimensional limit of a lexical VP, more precisely, I should say that what C_{hl} codes beyond these two chunks of structures will not be interpreted as 'lexical verbal projections' at the CI component. I come back to this issue in section 7.2.2.

¹⁴⁵ This mechanism shares a family resemblance to whatever is involved in the Subjacency condition. That poses the question of why displacement across cyclic domains is unbounded (if the right configurations obtain), while Case values are limited. This is interesting, but not a counterexample to my view: all it indicates is that 'escape hatches' exist for Subjacency. What needs to be explained is why Subjacency can be by-passed, not why, given the reasoning above, limited representational possibilities ensue.

5.

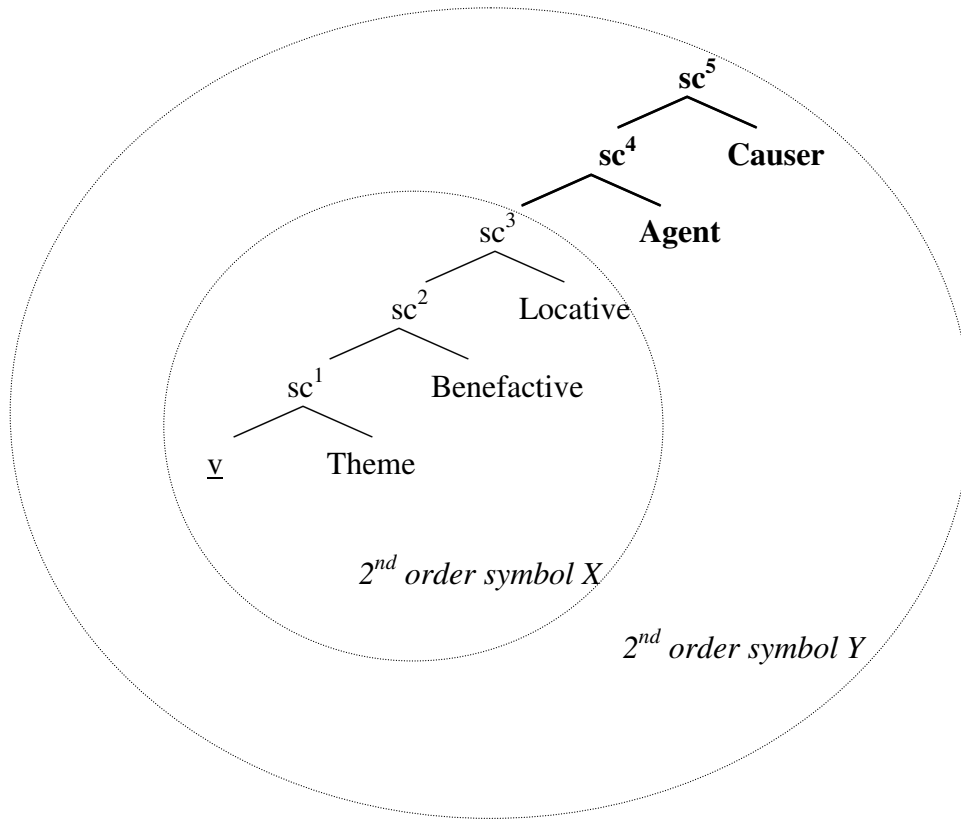


At this point, a 2nd order symbol is given to code the subjacent 2nd and 3rd Spaces. I return shortly to the nature of this symbol.

With that one symbol under its belt, C_{hl} goes on and repeats the procedure seen above. This results in the 4th and 5th dimensions. Those subjacent Spaces are then lumped together, again, in terms of a 2nd order symbol. C_{hl} stops there, since there are two subjacent 2nd order symbols coding the relevant structural complexities. To code more than this we would need either a counter or a 3rd order symbolic representation.

This leads us to conclude that the maximum number of dimensions warped within a lexical verb structure is exactly five. (Although keep in mind that we still have to justify further the 2nd order symbolic coding.):

6.



Readers may have noticed that the above procedure points towards, on the one hand, the expansion of a Space, and on the other, a culmination for that Space. These are the basic two concepts in the topological syntax as I have presented it here. This is just one step away from saying that there really are only two Spaces involved in the lexical verb structure, as alluded to in chapter 1 (a simple space and a hyper-space). The bi-clausal structure I argued for makes two warps possible, thus creating two layers of warping with two Spaces each. Possibly what underlies this ‘bi-clausality’ is, again, the ‘Subjacency’-like effect. In other words, the reason why a lexical verb structure is ‘bi-clausal’, not ‘tri-clausal’ or more, is this purely syntactic property (and see fn. 145).

7.1.2. Why There are Two Cases per Simple Sentence in Natural Languages.

The crucial point in the exposition above was that there are two spatial systems (expansion and bounding) per lexical verb. Supposing that C_{hl} encodes these pairs of Spaces into one 2nd order symbol each (assumption (2b) above) is really supposing that C_{hl} represents the syntactic structure of one space type by one symbol as it is constructed on-line. If this symbolization that C_{hl} performs on-line corresponds to abstract Case-marking (again ignoring the base), then the maximum number of abstract Cases per verb is obviously two, not four or five, in natural languages.

This approach amounts to be saying that C_{hl} does not care what ‘species’ of abstract Case is deployed in each instance. A full exposition of the Case system along these lines is beyond the scope of this thesis, but I would like to point out that the idea that Case is a device for coding structural complexity is not novel (see Uriagereka (forthcoming: chapter 5) for much discussion on this). It is also not the only 2nd order device the system deploys: one only has to think of a plethora of situations where simple 1st order conditions won’t do to state relevant grammatical principles: connectedness conditions, binding domains, situations where ungrammatical codings (literally a ‘*’, surely not a 1st order element in the lexicon) are erased by grammatical mechanisms as if they were words, etc. Generative grammar has never been shy on these sorts of devices, taking them head on. I thus don’t feel it is my specific duty to

motivate why the system resorts to a 2nd order Case coding, interesting though that surely is (as are all other 2nd order codings). My point is more modest: When cast in the topological syntax argued for here, the matter of Case as a 2nd order representation of the two types of spaces the system creates naturally corresponds to the observable facts. No more and no less.

In a sense, these 2nd order symbols are like ‘deep wrinkles’ that the system tries to get rid of. If a wrinkle remains, why the system, under my conditions, couldn’t have resorted to a *third* order of complexity in its representation (basically a symbol about a symbol about a symbol). That’s a fair question, although it is a fair question for the system more generally: Why don’t we have principles of grammar that, just as they can make reference to symbols about symbols (e.g. an erasable “*” in Chomsky (1989), to name an obvious instance among many others), make reference to symbols about those 2nd order symbols (for instance about *percentages* of starred examples, say). I know of no such principle of grammar, in general.

7.2. Comparison Between Baker’s Proposal and the Present One.

In this subsection, I would like to briefly compare my proposal with Baker’s very influential (1994, 2003). I set aside relatively low-level differences on substantial aspects of the two proposals: For example, Baker places Goal lower than Theme argument, and he has three layers of VP-internal structures. Contrarily, I propose Goal to be higher than Theme, and have five layers of VP-internal lexical

structures.¹⁴⁶ Instead, I would like to concentrate on two deep theoretical differences between Baker's proposal and mine: (a) the general character of syntactic objects, (b) the internal/external argument distinction. The first of these is based on a direct consequence of the Dimensional Theory that I elaborate on, and the second stems from my particular takes within this theory.

7.2.1. Theta Roles Revisited.

First and foremost, as does any other generative syntactician, Baker takes the basic characteristics of a syntactic object to be 'sets', and thus does not acknowledge any qualitative differences between, say, a stative verbal structure and an eventive one. For him, syntactic objects are the result of 'flat' merge. As a result, he has a head to assign theta-roles, and the theta role assigned by a given head remains primitive.¹⁴⁷ In contrast, following the Dimensional Theory, I take each 'layer' of VP to be the result of a syntactic operation that creates objects which are qualitatively, or

¹⁴⁶ In effect, Baker proposes that the hierarchy of arguments within a lexical verbal structure faithfully reflects the surface word order of dative constructions. To my mind, the strongest evidence for this view is the fact that there is no language which does not have dative constructions, but there are numerous languages that do not have double object constructions. However, double object constructions are indeed special as compared to other run-of-the-mill constructions dealt in chapter 3 section 3.5, for example. It thus may simply be the case that some syntactic *processes* associated with double object constructions are not available in some languages as a result of interactions of independent properties of those languages.

¹⁴⁷ For example, a Pred head assigns/licenses an external theta-role that an ordinary adjective cannot assign/license, turning adjectives into a class of stative verbs (Baker, 2003). However, unless a system has an inductive topological algorithm, the pattern of 5D-4D-3D preference order that we saw in 3.5 for hosting a certain theta-role of higher dimensional object cannot be easily accounted for, a matter I return to shortly.

dimensionally, different from the previous ones according to topological induction. As a result theta roles are not primitives, they emerge from dimensional complexity.¹⁴⁸ This was the original motivation between Uriagereka (1996) and subsequent elaborations of this idea. What I have further proposed within this system, and specifically to this thesis, is that the number of syntactic arguments a lexical verb takes mirrors the complexity of its syntactic structure, or its order of dimensional complexity; thus the SAAC Hypothesis.

In that light, recall the results, for instance, of the tests in chapter 3, section 3.5.1. There we saw that the most preferred acceptability order is the 5D-4D-3D sequence for the syntactic argumenthood of Benefactives. This is what the topological inductive architecture predicts. Couldn't Baker or any other researcher following his lead, then, simply adjust their tenets to my empirical results? Of course, but unless they also adjust their syntactic system to include more orders of complexity, as in the system I am assuming, that adjustment would be futile. This is because there would be nothing *natural* in the particular ordering found (empirically, as per my research) and mapping it to very dull set-theoretic syntactic objects. In those terms that particular mapping will be as good or bad (i.e. as natural) as any alternative. It will work, but we won't know why. What the 'warps' system attempts is something more ambitious: it is *because* of the orders of complexity in the syntactic system that the particular ordering we encounter in the lexical semantics is what it is. It couldn't have

¹⁴⁸ This presupposes a syntax-semantics correspondence to be precisely spelled out. See Uriagereka (forthcoming) on this general concern.

been, say, that Themes just happened to map higher than Causers, or at least not if the syntax/semantics relation is minimalistic. If or once that point is accepted, the only way one can have for grounding the syntactic part of the correspondence ('simplex syntax to simplex semantics, complex syntax to complex semantics') is if one *has* simplex and complex syntax to begin with, *within lexical structure*. I know of only two ways of ensuring that simplicity/complexity: (i) generative semantics, and (ii) the warps project. The former has syntax be a reflex of semantics; in the latter syntax is still syntax, but it can go higher order.

7.2.2. External versus Internal Arguments.

Baker draws a sharp line between external and internal arguments. My proposal also ends up sharply contrasting 'external' and 'internal' arguments in terms of their hosting structures: the 3rd VP is the right cut for me, separating regular mental spaces from hyper-spaces, with various consequences (see chapter 2 section 2.4, 2.5, chapter 5, and 6). However, substantive details aside, it is mainly *how* the two proposals get to this conclusion that differentiates them.

The external-internal argument distinction is based on rich empirical analysis in Baker's system –which of course I don't mean as a criticism. In fact, I also assume such a distinction, but instead of a primitive in the system, I would hope it to be the *result* of the properties of the C_{hl} . Whether or not I convince readers that my two cuts (between mono and bi-clausality in syntactic terms and corresponding simple and

hyper-spaces in semantic terms) are natural within my system, I take it that an explanation in these or comparable terms is necessary. Stating the difference, grounded as it may be on empirical results, is for me not enough –and my approach has something non-trivial to say about it.

7. 3. What's Old and What's New in my Proposal?

I would like, finally, to summarize what has been newly proposed in this dissertation within the Dimensional Theory, and how it fares against a rich and controversial tradition. First I have proposed that Aktionsart can be read off from dimensional complexities of syntactic objects and their associated 'theta-roles'. Specifically, I proposed the SAAC Hypothesis. According to the SAAC Hypothesis, the order of dimensional complexities of a lexical verb is faithfully reflected in the number of the syntactic arguments it takes. As for the substantial 'hierarchy' of theta-roles, I proposed that the Presentation for the 1st order of verbal dimensional complexity is the Theme, the one for 2D verb is 'Goal', 3rd is the Locative, 4th the Agent, and 5th and finally comes the Causer. I have further claimed that 'Goal' receives varying interpretations at the CI component, according to the overall order of verbal complexity: Experiencer for 2nd and 3rd VP, Goal for 4th VP, Benefactive for the 5th VP. This hierarchy has been tested by various means, including wh-extractions over a weak island. No matter how the rest of my proposals fare, on a theoretical perspective, I take it that this is an empirical base for others to challenge, question, or improve on.

Second, I have argued that dimensional structure in the lexical verbal domain is indeed syntactically and semantically real, by applying what has been proposed by Lasnik on VP ellipsis in inflectional morphology to derivational morphology. I discussed two differing methods of morphological amalgamation for derivational verb morphemes in English and Japanese: Syntax and PF. This strongly supported the inner syntactic make-ups of lexical structure. An analogous point was made through the structural positionings of causative and inchoative derivational morphemes in Japanese. There, each order of dimensional complexity has a profound impact on the class of eventuality a morpheme can describe. In particular, ‘dimensional talks’ are observed between certain derivational morphemes, which presumably find their roots in operations of the C_{hl} within the Dimensional Theory.

Readers might think that the fine grained distinctions I have argued for could have been assumed in other systems as well. This is, however, not so obvious to me. True, starting with the generative semantics project, one could simply say that all I have shown –in a contentious tradition– is that syntax doesn’t bottom out lexically, it goes all the way down to ‘thought’ or whatever the locus is for the appropriate bottom line. Why is what I’ve done *not* generative semantics? Actually, in all fairness that’s a question not just for me, but for the ‘warps’ project more generally. The answer is this: it is not generative semantics because it crucially assumes radical syntactic constraints. In fact it is the *anti*-generative semantics, as it attempts to have semantics *follow* from syntax, not the other way around. The thing is, though, that in order to

achieve this result, given that semantics (I take it) is clearly higher order, then syntax too must be higher order. And the only way of having that, in turn, follow is if the syntactic generative engine has the rough format of the number system –that is, taking seriously Chomsky’s intuition that the language faculty and the number faculty reduce to one another.

At that point, a natural mapping between syntax and semantics becomes possible. I should say it more bluntly: semantics, in what is analyzable by standard methods, then *reduces* to syntax. To the extent that there are observable complexities (in entailments, for example) these would be syntactic. Anything beyond syntax enters the realm of the elusive. To call this project ‘generative semantics’ would be a misinterpretation of both it and, for that matter, the more traditional enterprise.

One more point to add in this regard is the fact that I have liberally used notions like ‘canonicity’, or the various levels of representation in the system (radically, from PF to LF) to assemble words. I entirely believe in words: without them all my parametric distinctions would collapse. For generative semantics words were merely artifacts of spell-out. In fact, generative semanticists expected all languages to be like Japanese –the problem is that this is factually wrong. For me, explicitly, this is the result of having words *be* words at different points in the derivation, thus my proposal, why certainly not atomist, is massively lexicalist, more so than most proposals out there, since for me *when* a word is taken by the system to be a word has

drastic consequences for a variety of grammatical conditions, from ellipsis to entailments.

That said, I confess total ignorance over one crucial matter: Why does the system have words? If I am right, this can be a property of various levels or representation, which obviously complicates things even further. I cannot claim originality on this trend either. As far as I know it was Baker (1988) who made the first moves in this direction, when plausibly proposing that in some languages causative incorporation takes place in the LF component (see chapter 5 on this). I take it that incorporation *results* in word formation of some kind, uncontroversially –in this instance at LF. Moreover, Lasnik (1999) suggested an interesting explanation for pleonastic/associate dependencies based on morphological conditions *in the LF component*. That (assuming Morphology is the component that deals with words) is akin to claiming that Word Formation, again, can be an LF process. Not only do I see nothing wrong with these proposals, but in fact I have crucially assumed them here. We all must address what words are, though.

7. 4 Summary and Conclusions.

I have proposed a structure for lexical verbs that encodes the complexities and subtleties that events predicates involve. I have presented a model that is ‘internalist’ in the Chomskyan sense: Aktionsart properties of predicates are not a real-world affair, but an interpretation of a structure of mind. In the first half of the thesis, I have

shown that this structure yields correct interpretations for aspect-sensitive adverbials. Extraction data of predicates' dependents, the control possibility of the implicit argument in purpose clauses, and the very nature of a deduced Thematic Hierarchy, suggest that the complexity of events corresponds rather directly to the number of arguments predicates take. This is the SAAC Hypothesis. The latter half of the thesis mainly concerned itself with further elaborating the verb lexical structure within the topological syntax. I have argued for two strategies for amalgamating lexical verbs, thereby demonstrating a tight network of entailments that holds of lexical verbs. Crucially, this entailment pattern is derived from the architecture of the C_{hl} . Also, I have proposed structural positions of various lexical verb morphemes in a language where these notions appear to be very active syntactically: Japanese. The lexical verb structure in Japanese reflects the underlying bi-clausality rather directly in terms of morphemes, further supporting a natural mapping between syntax and semantics. At the very least, I think it is fair to say that this is a rather 'Minimalist' theory of Aktionsart.

Appendix 1.

Benefactives: More Verb Trios for Wh-Extraction Tests.

In chapter 3, section 3.5.2 I presented wh-extraction over a weak island as a way of diagnosing argumenthood of Benefactives. In this Appendix, I briefly present results of two additional tests which have different trios as a choice of 5D, 4D, and 3D verbs.

Test 1: *bring, push, arrive*:

1. ??For whom do you wonder whether Bill brought candy?
2. ?*For whom do you wonder whether Bill pushed a car?
3. ??*For whom do you wonder whether Bill arrived at an airport?

4. Grammatical judgments (of 14 informants):

	1: <i>build</i> : 5D	2: <i>push</i> : 4D	3: <i>arrive</i> : 3D
Best	9 (64%)	4 (28.5%)	1 (7%)
2 nd best	2 (14%)	7 (50%)	5 (36%)
Worst	3 (21%)	3 (21%)	8 (57%)

5. Rankings:

Acceptability order (from left to right):	Informants:
bring-push-arrive: (5D-3D-3D)	7 (50%)
bring-arrive-push: (5D-3D-3D)	2 (14%)
push-bring-arrive: (3D-5D-3D)	1 (7%)
push-arrive-bring: (3D-3D-5D)	3 (21%)
arrive-bring-push: (3D-5D-3D)	1 (7%)
arrive-push-bring: (3D-3D-5D)	0 (0%)

As 4 and 5 show, a total of 64% of my informants picked the 5D verb *build* as the preferred option among the sentences in 1-3, the 4D verb *push* as the second, and the

3D verb *arrive* as the least preferred. Moreover, 50% of the natives ended up with the acceptability order of 5D-4D-3D, the one also seen in section 3.5.2.

Test 2: build, push, reach:

6. ??For whom do you wonder whether Bill built a house? 5D verb: *build*
 7. ?*For whom do you wonder whether Bill pushed a car? 4D verb: *push*
 8. ??*For whom do you wonder whether Bill reached a summit? 3D verb: *arrive*

9. Grammatical judgments (of 13 people):

	6: <i>build</i> : 5D	7: <i>push</i> : 4D	8: <i>reach</i> : 3D
Best	8 (62%)	4 (31%)	1 (8%)
2 nd best	4 (31%)	5 (38%)	4 (31%)
Worst	1 (8%)	4 (31%)	8 (62%)

10. Rankings:

Acceptability order (from left to right):	Informants:
build-push-reach: (5D-4D-3D)	5 (38%)
build-reach-push: (5D-3D-4D)	3 (23%)
push-build-reach: (4D-5D-3D)	3 (23%)
push-reach-build: (4D-3D-5D)	1 (8%)
reach-build-push: (3D-5D-4D)	1 (8%)
reach-push-build: (3D-4D-5D)	0 (0%)

As 9 and 10 show, a total of 62% of my informants judged the 5D verb *build* to be the most appropriate among the three verbs tested in 6-8. The second choice was the 4D verb *push*, with the 3D verb *arrive* seen as worst. In addition, 38% of the natives chose the expected acceptability order of ‘build-push-arrive’ (cf. the next preferred order, at 23%)

Pending a fuller analysis of more verbal combinations, these data, confirm the results argued for in section 3.5.2, to the effect that Benefactives are syntactic arguments in the 5th order of verbal dimensional complexity.

Appendix 2.

Summary of Data: Minimal Pairs from Jacobsen (1992) and Suga (1979).

I. INCHOATIVE MORPHEMES:

(A) Total number of minimal pairs for inchoative morphemes: Grand total: 45:
[Total number: Jacobsen + Suga = 31: Suga only = 14: Total = 45]

	<i>ar</i>	<i>e</i> [3]	ϕ [27]	<i>i</i> [6]	<i>or, ore^{suga}</i> [5]	<i>are</i> [4]
<i>ar</i> [31]		[2+1 ^D] [=3]	[17+5 ^S] [=22]	1+1 ^{S.1} [=2]	1+2 ^S [=3]	1 ^{S.D}
<i>e</i> [8]			3+1 ^S +1 ^{S.D} [=5]			3
ϕ [5]				3+1 ^S [=4]	1	
<i>i</i> [1]					1 ^{S.1}	
<i>or</i>						
<i>are</i>						

Abbreviations:

- (a) 'X^S': X is listed only in Suga (1979), not in Jacobsen (1992).
- (b) 'N+M^S [=Z]': N-number of minimal pairs is obtained from Jacobsen (1992). M-number of minimal pairs is obtained from Suga that is not included in Jacobsen. Total number of the minimal pairs obtained is Z.
- (c) 'X^D': X-number of 'minimal pairs' is obtained from Suga that he lists as non-synonymous.
- (d) 'X¹': X appears only once in the dictionary Suga samples his minimal pairs from.

(B) Minimal pair examples for inchoative morphemes:

	<i>ar</i>	<i>e</i>	ϕ	<i>i</i>	<i>or, ore^{suga}</i>	<i>Are</i>
<i>ar</i>		<u><i>korog-e-ar</i></u> (stumble) <u><i>nuk-e-ar</i></u> ^{Differ.} (pull.off) <u><i>sabak-e-ar</i></u> (deal) [total: 2+1 ^D]	<u><i>ak-ar-ϕ??</i></u> (empty) <u><i>dok-ar-ϕ??</i></u> (remove) <u><i>fukum-ar-ϕ</i></u> (include) <u><i>hedat-ar-ϕ</i></u> (separate) <u><i>hekom-ar-ϕ??</i></u> (dent) <u><i>hikkom-ar-ϕ??</i></u> (retract) <u><i>itam-ar-ϕ??</i></u> (soil) <u><i>kagam-ar-ϕ</i></u> (bent)	<u><i>mit-i-ar</i></u> (fill) { 1 example. <u><i>maz-i-</i></u> <u><i>a^{suga}</i></u> (mix) [total: 1+1 ^{S,1}]	<u><i>nukum-or-</i></u> <u><i>ar</i></u> (warm.up) <u><i>um-ore-</i></u> <u><i>a^{suga}</i></u> (become.bu ried) <u><i>uzum-ore-</i></u> <u><i>a^{suga}</i></u> (become.bu ried) [total: 1+2 ^S]	{ 1 example. <u><i>uk-are-</i></u> <u><i>ϕ^{suga.Differet}</i></u> (become.care less, become- merry) [total: 1 ^{S,D}]
<i>e</i>			<u><i>hisom-ϕ-ar^{suga}</i></u> (lurk) <u><i>karam-ar-ϕ</i></u> (entangle) <u><i>nagusam-ar-ϕ</i></u> (comfort)? <u><i>sebam-ar-ϕ</i></u> (narrow)?? <u><i>subom-ar-ϕ</i></u> (shrink)? <u><i>sukum-ar-ϕ</i></u> (shrug) <u><i>tawam-ar-ϕ</i></u> (distort)? <u><i>tizim-ar-ϕ</i></u> (shrink) <u><i>tubom-ar-ϕ^{suga}</i></u> (shrink) <u><i>tum-ϕ-ar^{suga}</i></u> (fill, stack) <u><i>tutaw-ar-ϕ^{suga}</i></u> (come/go.along) <u><i>yasum-ar-ϕ</i></u> (rest)			

cont'd.	<i>ar</i>	<i>e</i>	ϕ	<i>i</i>	<i>or, ore</i> ^{<i>Suga</i>}	<i>are</i>
<i>ar</i>			<u><i>yowam-ar-</i></u> <u>ϕ^{<i>Suga</i>}</u> (weaken) <u><i>yurum-ar-</i></u> <u>ϕ</u> (loosen) [total: 17+5^S]			
<i>e</i>			<i>kak-ϕ-e</i> (lack) <i>mor-ϕ-e</i> (leak) <i>sor-ϕ-e</i> (bend) <u><i>suk-ϕ-e</i></u> ^{<i>Suga</i>} (see.through) <u><i>te-ϕ-</i></u> <u><i>e</i></u> ^{<i>Suga.Different</i>} (shine, blush) [total: 3+1^S+1^{S,D}]			<u><i>hag-are-e</i></u> ¹ <u><i>example</i></u> (peel.off) <i>mog-are-e</i> (pluck.off) [total: 2]
ϕ				<i>ak-i-ϕ</i> (become.b ored) <u><i>horob-i-ϕ</i></u> (become.e xtinct) <i>ko-i-ϕ</i> (become.a bsorbed, become enough) <u><i>ta-ϕ-i</i></u> ^{<i>Suga</i>} (become.e nough) [total: 3+1^S]	<i>kom-or-ϕ</i> (fill, become crowded) [total: 1]	
<i>i</i>					{ 1 example. <u><i>ok-i-o</i></u> ^{<i>Suga</i>} (happen) [total: 1^{S,1}]	
<i>or</i>						
<i>are</i>						

Abbreviations:

- (a) 'X': X appears only in Jacobsen.
- (b) 'X': X appears both in Jacobsen and Suga.
- (c) 'X^{Suga}': X appears only in Suga, not in Jacobsen.
- (d) 'X^{Different}': X appears only in Suga as non-synonymous.
- (e) 'X': X has another minimal pair in the table.
- (f) 'X¹': X appears only once in the dictionary Suga sampled his minimal pairs from.
(*Oobunnya Kokugo Ziten: Sintei-ban*. Year of publication is not listed in Suga.)
- (g): '{1 example: X}': same as (f). X appears only once, in Suga.

Note: I leave the following pairs out, from Suga:

- (1) intransitive verb (**vi**) to intransitive verb (**vi**) derivations:

vi: *yu-re-ru* (swing), vi: *yu-su-re-ru* (swing){Suga's 1 example}:

This is perhaps from: transitive verb, vt: *yu-s(-ru)* (swing) → vi. *yu-s(-ur)e(-ru)* (swing). vi is formed from vt with *e*.

(cf: vi: *yu-re-ru* (swing), vt: *yu-ru* (swing) [*e-ϕ* inchoative-causative Verb Class].)

[Other examples like this: vt: *aw-as* (match) → vi: *aw-as-(a)* (match). vi is formed from vt with *a*].

II. CAUSATIVE MORPHEMES:

(A) Total number of minimal pairs for causative morphemes: Grand total: 49:

[Total number: Jacobsen + Suga = 39: Suga only = 10: Total = 49]

	<i>as</i>	<i>e</i> [21]	ϕ [25]	<i>os</i> [1]	<i>se</i> [1]	<i>s</i> [1]	<i>Akas</i>
<i>as</i> [39]		18+3 ^S [=21]	12+2 ^S +2 ^{S.1} [=16] (ϕ -i: 1 ^S) [=1]	1 ^{S.1} [=1]	1 ^S [=1]		0
<i>e</i> [9]			8+1 ^{S.D} [=9]				
ϕ							
<i>os</i>							
<i>se</i> [1]						1 [=1]	
<i>s</i>							
<i>akas</i>							

Abbreviations: The same as the ones for inchoatives.

(B) Minimal pair examples for causative morphemes:

	<i>as</i>	<i>e</i>	ϕ	<i>os</i>	<i>se</i>	<i>s</i>	<i>Akas</i>
<i>as</i> , <i>ras</i> ^{Suga}		<u><i>ak-e-as</i></u> (open) <u><i>dok-e-as</i></u> (remove) <u><i>fukum-e-as</i></u> (include) <u><i>hedat-e-as</i></u> (separate) <u><i>hekom-e-as</i></u> (dent) <u><i>hikkom-e-as</i></u> (retract) <u><i>ik-e-as</i></u> ^{Suga} (put.flower .in.water; make.live) <u><i>kagam-e-as</i></u> (bend) <u><i>karam-e-as</i></u> (entangle)	<u><i>kabus-ϕ-as</i></u> (cover) <u><i>kurum-ϕ-as</i></u> (wrap) <u><i>husag-ϕ-as</i></u> (seal) <u><i>hasam-ϕ-as</i></u> (pinch) <u><i>hodok-ϕ-as</i></u> (disentangle) <u><i>hog-ϕ-as</i></u> (bore) <u><i>ki-ϕ-as</i></u> ^{Suga} (lack) <u><i>mog-ϕ-as</i></u> (pluck) <u><i>nug-ϕ-as</i></u> (take.off) <u><i>nuk-ϕ-as</i></u>	{ 1 example. <u><i>hotob-o-</i></u> <u><i>as</i></u> ^{Suga} [total: 1 ^{S.1}]		<u><i>mu-s-ras</i></u> ^{Suga} (steam) <u><i>nigo-s-ras</i></u> ^{Suga} (muddle) { 1 example. <u><i>hane.ka-es</i></u> - <u><i>s</i></u> ^{Suga} (bounce.off) <u><i>magira-s-</i></u> <u><i>was</i></u> ^{Suga} } [total: 2 ² +2 ^{S.1}]	

cont'd.	<i>as</i>	<i>e</i>	ϕ	<i>os</i>	<i>se</i>	<i>s</i>	<i>akas</i>
<i>as</i>		<i>nurum-e-as</i> (cool)?? <i>sebam-e-as?</i> (narrow) <i>subom-e-as</i> (shrink) <i>sukum-e-as</i> (shrug) <i>tawam-e-as</i> (loosen) <i>tamaw-e-as</i> (give)?? <i>tizim-e-as</i> (shrink) <i>tunag-e-as</i> (connect) <u><i>ukab-e-as</i></u> ^{<i>suga</i>} (float) <i>yasum-e-as</i> (rest) <i>yugam-e-as</i> (distort) <u><i>nob-e-as</i></u> ^{<i>suga</i>} (extend) [total: 18+3^S]	<p>(pull.off) <i>sabak-as</i> (comb) <i>sog-ϕ-as</i> (sharpen) <u><i>tok-ϕ-as</i></u>^{<i>suga</i>} (melt) <i>tum-ϕ-as</i> (stack) <i>{1 example:</i> <u><i>tuk-ϕ-as</i></u>^{<i>suga.1</i>}(reac h) <u><i>mos-ϕ-yas</i></u>^{<i>suga.1</i>} (burn)} cf: [ϕ-i: <i>mog-ϕ-i</i>^{<i>Suga</i>} (pluck)] [total: 12+2^S+2^{S.1}] [ϕ-i: 1^S] </p>				
<i>e</i>			<i>awas-ϕ-e</i> (match) <i>kabus-ϕ-e</i> (cover) <u><i>kurum-ϕ-e</i></u> (wrap) <i>hasam-ϕ-e</i> (pinch) <i>husag-ϕ-e</i> (seal) <i>tamaw-ϕ-e</i> (loosen)??				

cont'd	<i>as</i>	<i>e</i>	ϕ	<i>os</i>	<i>se</i>	<i>s</i>	<i>akas</i>
<i>e</i>			<u>tunag-ϕ-e</u> (connect) <u>tum-ϕ-e</u> (stack) <u>fukum-ϕ- <i>e</i>^{suga.Different}</u> (include) [total: 8+1^{S,D}]				
ϕ							
<i>os</i>							
<i>se</i>						<i>kabu-s-se</i> (cover) [total: 1]	{ 1 example <u>ne-kas-</u> <u>se</u> ^{suga} : (make.sleep p) indicates 'a' on 'akas' is another morpheme } [total: 1]
<i>s</i>							
<i>akas</i>							

Abbreviations: The same as the ones for inchoatives; Plus:

(a) 'X': X is listed as a lexical causative verb with *-as* in Jacobsen (1992). I picked up the rest of *as*-minimal pairs in the table based on his list of lexical verbs.

I leave out the following minimal pairs from Suga:

(1) **vt-vt-vt** derivations: naku-s (lose), naku-nasu (lose), naku-suru (lose): { 1 example }:

[cf: vi-vt: ne-(ru) (sleep) → (sleep, caus.): ne-se(ru) & ne-kas(u), ne-kas-e(ru)]

[cf: vi-vt: naku-nar (lose)-naku-nas (lose): → reanalyzed as: nakun-ar (lose)-nakun-as (lose) → reanalyzed as: nakuna-r (lose), nakuna-s (lose). So, this is another example of 'ar-as' inchoative-causative alternation suspicion, a Verb Class that's supposed not to occur in Jacobsen (1992).]

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