Verb Meaning and the Lexicon: A First Phase Syntax

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Chapter 1

Introduction

Classical generative grammar partitions linguistic competence into three basic components: lexical knowledge, phrase structure rules and transformational rules (Chomsky 1965,Chomsky 1981). One of the fundamental debates over the years, and one which is still alive today, concerns the division of labour between information and processes that reside in the Lexicon and those rules and processes that are part of Syntax.

In this monograph, I explore a view of the architecture of grammar whereby the Lexicon is eliminated as a module with its own special primitives and modes of combination. By this, I do not intend to deny that there are items within the language that need to be listed/memorised, or that they are associated with grammatical information. Rather, I will seek to claim that to the extent that lexical behaviour is systematic and generalisable, this is due to syntactic modes of combination and not to distinct lexicon internal processes (cf. Hale and Keyser 1993 etc.). The general ideology is not novel; I am attempting to implement an old idea in the light of current, more advanced, knowledge concerning the nature of 'lexical' generalisations and patterns. In pursuing, as I will, a radically unstructured view of the lexicon, I engage with recent ideas of constructionalism (cf. Marantz 1997b, Borer 2005, Goldberg 1995) and make my own proposal based on what I take to be the core empirical issues of 'thematic' roles, event structure (aktionsart) and selection.

Two distinct types of lexical information have always been recognised: unstructured encyclopaedic information with its infinitely variable web of association and nuance; and the grammatically relevant, more systematic, class of information that interfaces with the syntactic system (Chomsky 1965, Jackendoff 1983). The classical assumption has been that two such types of meaning coexist

in a module that is termed 'the lexicon', with the latter level being the linguistically relevant 'subset' of the former (cf. Levin and Rappaport Hovav 1995, Levin and Rappaport 1998).

Taking the existence of a lexical module of some sort for granted, many early generativist debates were concerned with the location within the grammar of particular sorts of linguistic generalisations i.e. whether they should more properly be considered 'lexical' or 'syntactic' (see Chomsky 1970 for foundational early discussion, as well as later debates staged in Baker 1988 and Belletti and Rizzi 1988 vs. Alsina 1992 and Bresnan and Moshi 1990). Importantly, claiming that there are generalisations that can only be stated at the level of lexical information is different from merely accepting that lexical items possess syntactic information, hence the debate. In general, some theories such as LFG sought to establish the validity of separate modules with their own subprimitives and modes of combination, linked by correspondence rule (Bresnan 1982); whereas GB theory and its descendants took the view that the lexicon should be seen as the repository of essentially idiosyncratic/memorised information with no independent combinatorial primitives (Chomsky 1981). It is a version of the latter position that I will be arguing for in this paper, although the details prove stickier than one might imagine if one is intent on not begging the important questions.

The main challenge to the unstructured lexicon view has always been the existence of thematic, or argument structure generalisations[1], captured in GB theory via the D-structure level of representation, or by Hale and Keyser via L-syntax (an encapsulated syntax for the insertion of lexical items). In more recent minimalist work (Chomsky 1995, Chomsky 2000), presumably no such level of representation can exist, but the operation of 'initial' Merge is potentially available as a locus for these generalisations. Since this operation is triggered by selectional features (Chomsky 1995), capturing generalisations at this level will depend on the nature of the features involved, and the nature of selection and insertion of lexical items.

The key here is therefore the features on lexical items and how they might be deployed to create selectional generalisations. One approach to the problem is to deny that such selectional generalisations exist. This is the view most recently taken by Marantz 1997b, Borer 1998 and Borer 2005, whereby lexical items possess no syntactically relevant information that could constitute a constraint on their insertion possibilities (not even category information). The descriptive lim-

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[1]I am concerning myself purely with syntax here. Lexical phonology, if it exists as a distinct set of operations from post lexical phonology, might constitute another such challenge. I will assume optimistically, for the purposes of this paper, that those challenges can also be overcome.

its reported in more standard accounts, would then have to be due to limits based on real world knowledge and convention (extralinguistic). While I will be sympathetic to the attempt to void the lexicon of argument structure information and processes, I will still seek to encode some notion of selectional information that constrains the way lexical items can be associated with syntactic structure (so in this sense I will consider myself responsible for at least some of the data cited by the lexicalist camp e.g. Levin and Rappaport 1998, Reinhart 2002).

One of the things I will take for granted in this work is that human beings' linguistic competence consists crucially of a (linguistically specific) combinatoric system.[2] It is this combinatorial system that I will be referring to with the term 'syntax', and I will assume that the system itself is universal. Under the view I will be pursuing here (and one that is implicit in much work within minimalist syntax, and even earlier), this is the *only* linguistically relevant combinatorial system that there is, i.e. we are dealing with only one set of primitives and one set of operations.

Thinking of the lexicon as a repository of idiosyncratic and memorised information seems at first blush to be a demotion of its importance in the system linguistic competence. In fact, however, the lexicon is crucial as the mediatory knowledge store that allows the connection between the combinatoric system and real world information to be made. Thus, I propose that we see the lexical item as the locus of cross-modular information: it is the bundling of phonological, encyclopaedic, conventional and syntactically relevant information via some sort of memorised association. As I discuss in chapter 3, it is the syntactic information, or tagging, on the lexical item, that allows the combinatoric system to connect to encyclopaedic content on the one hand, and phonetic content on the other. This is one reason not to embrace the complete radical constructionalism of Borer 2005: in the absence of any syntactic information at all, the lexicon reduces to a nomenclature whose cooption by the syntactic combinatoric system is reduced to an accident, or at best a mystery.

Syntactic category information appears to be unavoidable for mediating the association of 'functional' lexical items and syntactic structure. If we can reduce all the 'selectional' constraints of so called 'lexical' categories to this type of asso-

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[2]Here I also wish to abstract away from the debate concerning whether this combinatoric system is representationally innate in the sense of all the basic knowledge existing in a hardwired repository of brain structure, or whether it emerges inexorably as a result of the learning strategies abstractly encoded in a language acquisition device. In fact, it is not even relevant to my argumentation whether the combinatorial system that emerges is specific to language, or whether it is part of a more general human symbolic capacity.

ciation too, then there is no argument against it from parsimony. As with all proposals concerning the architecture of the system, one makes a choice as to where the complexity of that system resides. Under this view, there is only one combinatorial system, and the primitive modes of combination will be minimalist (i.e. confined to (Re)Merge and Agree, triggered by the need to check uninterpretable features), but the complexity will reside in the extended functional sequence assumed in the syntax and the larger set of category features that implies.

The other main point that I want to argue for in this book concerns the nature of the syntax-semantics interface. The basic combinatoric system of the lowest part of the clause emerges as something which encodes semantic information as well as the traditionally syntactic. An inevitable consequence of the separation of lexical encyclopaedic information from the structural is that the structures themselves will be seen to determine abstract predicational and event compositional semantics. However, unlike the 'constructional' grammar of Goldberg (1995), this semantics will not be associated with arbitrarily large syntactic objects, but constructed systematically on the basis of primitive recursive syntactic relationships. I will argue that once the most atomic predicational relations among basic formatives are taken into account, it is possible to see complex event structural and argumental relations as being decomposable into simpler ones, which moreover correspond to the simplest primitives of *syntactic* combination (here taken to be MERGE and a distinction between specifiers and complements). Thus, the decomposition of verbal meaning will lead to a proposal concerning the functional sequence of the lowest part of the clause, and universal combinatoric semantics that goes along with it. Isolating this systematic semantic combinatoric component of the grammar is only possible once a principled line is drawn between it and the lexical encyclopaedic and real world knowledge that goes along with every actual verb in context.

The problem of what constitutes the lexical information determined by a verb carries us first into the domains of argument structure specificity and flexibility, and event structure/aktionsart specificity and flexibility. What will emerge from the initial empirical discussion and summary from the literature in chapter 2 is that a particular set of featural or combinatoric primitives seem to be implicated in the linguistic generalisations we find. The challenge of expressing the lexical information in both these domains is to express both the flexibility and the limitations that exist, and the interplay between different elements of the structure in a systematic way. In chapter 3, I make a specific proposal concerning the nature of what I will call 'first phase syntax', and the relation between it and the lexicon. The central feature of 'first phase syntax' is that it decomposes the information

classically seen to reside within lexical items into a set of distinct categories with specific syntactic and semantic modes of combination. Lexical items in English will be seen to be featurally complex, with their argument structure properties and flexibility deriving ultimately from the association rules that link the particular feature bundle to the syntactic combinatoric system. In chapter 4, I will use the system to spell out the decomposition of basic verbs in English in their different uses, including a reconceptualisation of the classic Hale and Keyser conflation type verbs, and an analysis of the double object construction. In chapter 5, result augmentation is considered. Here I examine in some detail the range of resultative and path augmentations in English, including prepositional phrases with motion verbs, and adjectival resultatives. The verb-particle construction is also discussed here as one of the most abstract morphemes in English contributing to the first phase. I compare the particle construction in Germanic with completive complex predicates in South Asian languages and lexical prefixes in Slavic, arguing that the same underlying first phase syntax is involved, but with different morphological composition. In chapter 6, I tackle the process of first phase syntax augmentation in the form of causativisation, using the productive morphology of direct and indirect causation in Hindi/Urdu as a test case. The final chapter is the conclusion and summarises the proposals made in the book, and includes some speculations about how the system argued for interacts with the rest of the combinatoric system with its more extended functional sequence.

Chapter 2

The Empirical Ground

2.1   Selection vs. Variability

Over the years, it has been acknowledged that in addition to syntactic category information, lexical entries need to contain information related to their selectional properties. The specification of syntactic complementation can account for the difference between transitive and intransitive verbs for example (1), or for the difference between the verbs that take CP complements vs. IP complements on the other (2).

(1) (a)John saw the lizard/ *John saw.
     (b) *John dined the tortellini./ John dined.

(2) (a) John hoped that the rain would fall./*John hoped the rain to fall.
     (b) *John got that the rain would fall./John got the rain to fall.

Syntactic selectional information however, is not always deemed to be enough since there seem to be generalisations related to the *type* of semantic participant that make a difference to the linguistic behaviour of different verb types. So for example, transitive experiencer subject verbs behave differently from transitive verbs with agentive subjects (3) (refs), and intransitive verbs with patient arguments (unaccusatives) seem to behave differently from intransitive verbs with agent arguments (unergatives) (4) (Perlmutter 1978, Williams 1980, Marantz 1984, inter alia).

(3) (a) John fears tigers.
     (b) John kills tigers.

(4) (a) The vase fell.
    (b) John danced.

To the extent that these differences are grounded in genuine linguistic be-
haviour, and not simply a difference in real world understanding, it seems as if
they need to be represented in the lexical entry of the predicates involved. The-
matic roles are one way of dealing with generalisations of this type (Gruber 1965,
Baker 1988, Grimshaw 1990). Once thematic role information, or semantic se-
lectional properties are enshrined in the linguistic system in the form of theta-
marking, it is tempting to try to reduce facts that could be accounted for by syn-
tactic selection to this kind of semantic selection as well, so that only that type of
information need be present in the lexical entry (Grimshaw 1979, Pesetsky 1982,
and recently in the context of distributed morphology Harley and Noyer 2000).
However, there are two basic problems with making the reduction in this direc-
tion.

Firstly, there are serious doubts concerning the definability and empirical ad-
equacy of thematic role classifications. The ultimate success of a theory of θ-role
types depends on finding linguistically legitimate natural classes of arguments
which can be systematically identified and studied. As Dowty (1989) has argued,
the θ-role labels as traditionally formulated do *not* give rise to natural linguistic
classes in terms of their syntactic or semantic behaviour (see also Croft 1998).
In particular, Dowty (1989) has shown that many of the linguistic generalisations
traditionally stated in terms of particular thematic relations, on further analysis
have turned out to rely on distinctions *within* a particular thematic class[1] or on
different semantic primitives altogether.[2] In addition, using principles like the
thematic hierarchy to regulate mapping to the syntax does not always give the
correct empirical results (cf. dative alternation verbs, psych predicates with either
experiencer objects or experiencer subject, or spray-load alternations).

More recent argument role classifications have zeroed in on the fact that the
factors that seem to make a difference to linguistic behaviour are correlated with
event structure or aktionsart properties. Vendler's 1967 article presenting the Aris-
totelian classification of event types and relating it to classes of predicate in natural

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[1]While the initial generalisation was that 'do so' substitution and the progressive both picked
out the class of verbs with 'Agent' subjects, it turned out that two different notions of Agent had
to be distinguished: one characterised by the presence of motion or instigating change (for the 'do
so' test), and the other characterised by volition (for the progressive) (Dowty (1989)).

[2]In the case of Dutch, auxiliary selection is argued in Zaenen (1993) to be sensitive not to
'Theme' subject vs. 'Agent' subject, but to the difference between definite and indefinite change
of state (accomplishment vs. achievement).

language is the source of much stimulating work on the aspectual or event structure classification of verbs (Dowty 1979, Taylor 1977, Kenny 1963). While it is now understood that the original division into *states*, *activities*, *achievements* and *accomplishments* cannot correspond directly to what is specified in the lexicon, many theories attempt to use lower level aspectual *features* that are derived from these larger natural classes. In particular, notions such as *telicity*/*boundedness*, *dynamicity* or *durativity* have played an important role in subsequent theories of event structure decomposition and lexical classification. In general, many researchers have attempted to classify verbs by means of their inherent aspectual properties (Grimshaw 1990 Hoekstra 1984 Tenny 1987 Levin and Rappaport Hovav 1995) as a way of capturing important linguistic generalisations.

Recently, many linguists have attempted an explicit aspectual classification of thematic roles and relations themselves, often primarily to account for aspectual compositional effects. Most notable in this class are the proposals introducing lower level features such as +ADD-TO, +SQA (Verkuyl 1989, Verkuyl 1993) or QUA and Mapping-to-Objects (Krifka 1987) which can combine with the features of the lexical predicate to give telicity under certain conditions. The aspectual thematic role in this sense is defined by the entailments about aspectual structure that it gives rise to (see also Ramchand 1993, Ramchand 1997). These classifications are more successful than the classical thematic role labels because they are definable on the basis of genuine linguistic diagnostics and are better at accounting for data such as the spray-load alternation and the unaccusative/unergative divide.

However, even these more satisfactory classifications of participant relations have to deal with the second problem facing any attempt to reduce lexical classification to semantic selection. This is the fact that argument structure information is actually not nearly as rigid as lexical classification in general would imply. Any system of lexical classification of role types (whether classically thematic or aspectual) has to face the reality of argument structure variability, in a fairly systematic and predictable form. For example, in English, a large class of verbs systematically occurs in an intransitive version with a single 'internal' or theme-like argument, as well as a transitive version with both an agent and a theme (the 'ergative' class of verbs, according to the terminology of Hale and Keyser 1987).

(5) (a) The glass broke.
    (b) John broke the glass.

These argument structure alternations, whether mediated by morphological affixation or not, in English and other languages (e.g. middle formation, passive,

causativisation etc.) seem to offer evidence for systematic lexicon-internal processes as an alternative to stipulated ambiguity with multiple lexical items (cf. Levin and Rappaport Hovav 1995). Unless such 'lexical redundancy rules' are postulated, representations of lexical information run the risk of failing to capture pervasive generalisations concerning related/phonologically identical lexical items.

At the extreme end of the spectrum, the variability of behaviour seems so rampant as to be virtually unconstrained except by real world knowledge. Consider for example, the transitive creation/consumption verb such as 'eat' in English, which can appear in the following grammatical environments with different aspectual effects.

(6) (a) John ate the apple.
     (b) John ate at the apple.
     (c) The sea ate into the coastline.
     (d) John ate me out of house and home.
     (e) John ate.
     (f) John ate his way into history.

Data like this tempt one into the radical constructionalist approach of Borer 1998, Borer 2005 or Marantz 1997b, whereby no lexical information is present at all, but lexical items are inserted into syntactic contexts according to compatibility with encyclopaedic and real world knowledge. Under this view, the generalisations reside in the systematic ways in which syntactic structures are interpreted by the linguistic computational system, not in the information specified by lexical entries.

At the same time, however, verbal flexibility is not completely general, as the data in (7) and (8) show, otherwise the constructionalist view would be unavoidable.

(7) (a) John arrived.
     (b) *Bill arrived John.

(8) (a) Mary weighs 100 pounds.
     (b) *Mary weighs.

Flexibility exists on the level of aspectual specification as well, giving rise to proposals for lexicon internal processes such as Levin and Rappaport's (1998) template augmentation or event type-shifting (van Hout 2000, 2001). The two

core cases of event type shifting involve (i) the adding of a causative subevent to an already possible event structure (as in (9)), or (ii) the adding of a telos to a process verb (as in (10))[3]

(9) John jumped the horse over the fence.

(10) John ate the porridge up.

But once again, these processes are not completely general since some verbs seem to resist causativisation (11a), and others resist telic augmentation (11b)

(11) (a) *John slept the baby.
     (b) *John watched Mary bored/to boredom.

Thus flexibility in event structure and argument structure goes hand in hand with more intangible limits and constraints.

The strategy I will pursue is first of all to reject the existence of formal semantic selectional features in the lexicon, but attempt to account for what rigidity there is in terms of purely syntactic or categorial features, made possible by a more articulated view of the functional sequence within the verb phrase. I will show that once the selectional generalisations are properly understood and isolated from the more heterogeneous and unsystematic felicity conditions based on encyclopaedic meaning, they will be seen to be amenable to representation in terms of an articulated syntax with a systematic semantic interpretation. This will allow a radical simplification of the architecture of the grammar by reducing the set of combinatorial primitives and will account for important crosslinguistic data concerning the nature and flexibility of lexical items.

The first step is to establish and motivate the primitives that are empirically necessary in a decomposition of verbal meaning — this is what the remainder of this chapter sets out to do. This sketch is intended as a basic outline of the important distinctions that need to be made in the face of the broadest empirical patterns, not as a complete exegesis of verb types. In chapter 4, after the theoretical machinery has been introduced, I will return to the data in an attempt to offer diagnostics and to be more explicit about the syntax and semantics of individual verb types.

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[3]Here I am assuming that a telos can be added by a PP, adjectival resultatives, and particles.

2.1.1   Causation

The approach I will take here is to argue that establishing the primitive role types goes hand in hand with establishing the primitive elements of event decomposition, since participants in the event will only be definable via the role they play in the event or subevent. The first component of verbal meaning that has received much empirical support in the literature is that of causation. Causation has been shown to be a relevant parameter in verbal differences and shows up very often as overt morphology within the verbal inventory of human languages (cf.Baker 1988, Hale and Keyser 1993, Ritter and Rosen 1998, Rappaport-Hovav and Levin 2000). Moreover, as I will argue next, it is implicated in the external vs. internal argument distinction that has been used as a defining property of verb classes within languages.

Ever since the unaccusative hypothesis of Perlmutter 1978, the existence of an 'external argument' or 'agent' has been cited as criterial of a major division in (intransitive) verb types (cf. Williams 1980, Marantz 1984). However, Rappaport-Hovav and Levin 2000 show convincingly that it is not agency per se that determines class membership as either unaccusative or unergative. The following intransitives cited by them pass the diagnostics for unergativity in Italian, Dutch and Basque even though they are profoundly non-agentive.

 (12) *glow, stink, spew*

Even in English, the fact that these verbs possess an external argument can be demonstrated by their ability to take *X's way* objects under certain circumstances (examples 13) and also show an inability to causativise (examples 14)[4].

 (13) (a) He stank his smelly way home.
        (b) The water spewed its way along the corridor.
        (c) John ran his way into history.

 (14) (a) *Michael glowed Karena's face.
        (b) *We spewed the water out of the sink.
        (c) *We stank the dog by throwing him in the cesspit.
        (d) *John ran Mary by scaring her with a live mouse.

While it is true that many types of external argument can be distinguished according to different semantic properties such as volitionality/agency (Butt 1995

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[4]These examples are taken from Rappaport-Hovav and Levin 2000

for Hindi/Urdu) or active vs. inactive causing (as in Doron 2003), they all seem to be subclasses of argument that all behave importantly the same way with respect to certain core linguistic diagnostics, and crucially differently from internal arguments. Thus, I will accept the general intuition that there is an important primitive underlying the distinction between 'internal' and 'external' arguments (cf. Marantz 1984) , but I will assume (with Rappaport-Hovav and Levin 2000 and many others) that the relevant abstract category is that of 'initiator'. An initiator is an entity whose properties/behaviour are responsible for the eventuality coming into existence. Thus, 'stinking' has an external argument which is the initiator by virtue of inherent properties of dirtiness or smelliness; the water is the initiator of a spewing event by virtue of the fact that it has the requisite properties of kinetic energy; volitional agents have intentions and desires that lead them to initiate dynamic events; instrumental subjects are entities whose facilitating properties are presented as initiating the event because they allow it to happen. There is a sense in which all of these 'thematic roles' are just real world instantiations of the more abstract concept of causation[5].

Among transitive verbs as well, external arguments can be volitional agents (15a, 15b), instrumentals (15c), abstract causes/sources (15d 15e, 15f), showing the generality and abstractness of the external argument relation.

(15) (a) John broke the window.
    (b) John built that house.
    (c) The hammer broke the window.
    (d) The videotape from the secret camera demonstrated the truth of the matter.
    (e) The storm broke the window.
    (f) John's money built that house.

I'm going to assume, therefore, that even though agency might be relevant for felicity in certain circumstances, it does not directly determine syntactically relevant class membership. The relevant notion here is that of causation or initiation, or more abstractly, the existence of a causing subevent, which has a DP role associated with it via the syntax (similar to Kratzer 1996) and which is specified

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[5]it is important to be clear that these are not claims about the real world, but about how human beings systematically interpret the situations they perceive in the world. Causation appears to be a very basic organisational category in these 'interpretations' and consistent with a number of different real world possibilities.

more particularly by the lexical encyclopaedic knowledge of the verb itself.[6] I
also leave it open exactly how the truth conditions of causation/initiation should
be specified. All that is necessary for our purposes is to establish existence of a
primitive notion at this level of abstraction that corresponds to the linguistic real-
ity of how speakers conceive of events and their components. The details of this
position will be taken up again in chapter 3.

2.1.2 Telicity

Telos or resultativity is also a component that has been shown to be isolable as
a parameter in verbal meanings, and which has associated morphology and case
marking reflexes in various languages (see for example Tenny 1987, Kiparsky
1998, van Hout 1996, Ritter and Rosen 1998, Borer 1998). Semantically, it has
been widely argued that the combination of 'process' and 'result' creates complex
accomplishments (Parsons 1990,Pustejovsky 1991, Higginbotham 2001). These
two subevental components can be found separately or combined within different
verbal meanings, and can even be exploited to create more complex types out of
simpler ones in many systems, cf. template augmentation (Levin and Rappaport
1998) or event type-shifting (van Hout 2000a, van Hout 2000b).

First, I wish to show that while there definitely are privileged relationships
between certain arguments and certain aspectual subevents, the relationship is not
as straightforward as it might seem from only examining a subset of verbal types.
In particular, there is no general one to one correspondence between 'internal ar-
guments' and the semantic feature [+telic], even when the internal argument in
question is 'quantized' (in the sense of Krifka 1987, Krifka 1992). This is contra
the position taken in Kratzer 2004, Borer 2005 and van Hout 2000a. Specifically,
I will argue that there are two distinct kinds of aspectually sensitive internal argu-
ments, and that 'quantization' is only relevant for a subtype of one of these.

The arguments for the lack of a simple relationship between the feature [+telic]
and the internal argument go in both directions. First of all, the existence of telicity
does not actually imply the existence of an internal argument at all, as the simple
examples in (16) below demonstrate.

(16) (a) John stood up in a second. (*no internal argument*)
     (b) They found gold in 3 hours. (*mass term internal argument*)

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[6]In the implementation that follows in chapter 3, I will not use the device of 'flavours' of little
v (as in Harley 1995) to capture the different types of initiator found in language, but relegate such
differences to the encyclopaedic content of the root, or whatever lexical element fills that position.

Conversely, equally basic English examples can be used to show that the existence of an internal argument does not imply telicity (not even when it is quantized) (17).

(17) John pushed the cart for hours.

Kratzer 2004 builds on work by Kiparsky 1998 and Ramchand 1997 to offer a syntactic analysis that respects the semantic/aspectual correlates of differential object case marking in Finnish and Scottish Gaelic respectively, and found in many other languages. Her account makes a distinction between telicity and quantization, and *conditions* of culmination. In her account, objects are directly or indirectly responsible for establishing measures over the event, and need to move to check their accusative feature (there seen as the uninterpretable counterpart of a [+telic] feature) in a higher aspectual projection just outside *v*. In this sense, the account is fairly similar to that found in Borer 2005, where the quantized object must move to check its quantity feature against the quantity feature in the aspectual head dominating the verb phrase.[7] Both accounts must make extra stipulations to account for the cases where quantized objects do not in fact induce telicity (quantizedness on the part of the event), or cases where a nonquantized argument nevertheless occurs with a telic event. In the case of Kratzer, this comes down to invoking covert measure phrases which must cooccur with objects that are not themselves measures; for Borer, independent (non-object related) ways are found to check the quantization feature on the aspectual head. However, both of these strategies weaken the system considerably, or rather, weaken the support for a syntactic featural connection between quantization or accusative on the direct object and telicity or quantization on the verbal projection. The exceptions to the correlation, in my opinion are central and normal enough that they cannot really be seen as 'exceptions'. Instead, I propose to make some finer-grained distinctions in terms of how the direct object maps onto the event, although I will preserve the intuition that some kind of event-topological mapping is criterial of direct objecthood.

The idea which I see as central to the distinctions we need to make is that of a 'path' to the event. By this I mean that dynamic verbs have a part-whole structure, as defined by our human perception of the notion of change. In this sense, dynamic events are generalised 'change' analogues of spatial paths. As we

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[7]Kratzer rejects the Krifka 1987 notion of quantization as being exactly the right notion here. So in fact, does Borer— although she retains the term, she offers a different definition of quantization than the one in Krifka 1987.

saw in the previous section, a certain class of arguments of a dynamic predicate can be distinguished as 'external'— they are related to the event as a whole, with a kind of abstract causational or initiational semantics. Internal arguments on the other hand are internal to the path structure of the event. However, I would argue there are number of semantically distinct ways in which they can do so. The first obvious case to consider is the argument that is interpreted as undergoing the change asserted by the dynamic verb (cf. a general 'Undergoer' role, after Van Valin 1990).

There are two distinct points to be made here. The first is that even if we characterise an internal argument as one that crucially undergoes change, empirically it does not seem true that the change must necessarily entail the attainment of a *final* state.

(18) *widen, harden, melt, dry*

The verbs shown above satisfy tests for unaccusativity in languages that show these clearly, and yet, they are not obligatorily telic. A gap can widen but is doesn't necessarily become wide; the chocolate can melt, but it does not have to become completely liquid.

(19) (a) The gap widened for three minutes (and then it began to close again).
     (b) The chocolate melted for 3 minutes in the back seat of the car (before we rescued it).

While the attainment of a result state can give rise to telicity, mere gradual change on the part of an argument is a distinct aspectual property and one which is logically separable from the attainment of a result (although sometimes one can be implied by context if the semantics of the verb is suitable), and hence is compatible with a lack of temporal bound (see Hay, Kennedy, and Levin 1999 for an important discussion of the semantics of scales with regard to change of state verbs). Verbs which have an argument that undergoes a gradual change (without attainment of a definite result) often display unaccusative behaviour in the languages where the diagnostics are clear, indicating that they actually have internal arguments in the relevant sense. Correspondingly in English, as Rappaport-Hovav and Levin 2000 note, these verbs do not occur in the *X's way construction*; and many of them *do* causativise.

(20) (a) John widened the gap between himself and his opponents.
     (b) Karena melted the chocolate in the pan.

It seems that what is crucial here is the notion of the argument undergoing some sort of identifiable change/transition, for example whether it is with respect to its location (21a), its state (21b), or its ullage[8] (21c).

(21) (a) The ball rolled down the hill.
    (b) The mangoes ripened in the sun.
    (c) The bucket filled with rain.

In the case of transitive verbs, we find direct objects that fulfil this condition of 'undergoing change' as well: DPs can make good 'objects' regardless of whether the change is that of location (22a), state (22b) or material properties (22c) (see Ramchand 1997 and Hay, Kennedy, and Levin 1999).

(22) (a) John pushed the cart.
    (b) Mary dried the cocoa beans.
    (c) Michael stretched the rubber band.

The broad notion of UNDERGOER (after Van Valin 1990) seems to be the one responsible for class membership here, and includes objects of verbs of change of state like *dry*, as well as objects of verbs of translational motion like *push* and *drive*. In other words, the existence of an UNDERGOER does not necessarily imply telicity, even when it is quantized (however we choose to define that).

(23) (a) The document yellowed in the library for centuries.
    (b) John pushed the cart for an hour.
    (c) Mary dried the cocoa beans in the sun for an hour.

These objects are in a very general sense distinct from the causers/initiators of the previous section. What they all have in common is that they are 'undergoers' of transitional states; this fact holds regardless of the internal denotational constitution of the DP in question.

What then of the notion 'quantized-ness' or 'specified quantity' that has played such an important role so far in the literature on aspectual composition? Is there a class of verbs or class of objects that needs to be distinguished from general undergoers on the basis of their linguistic behaviour? Starting with Verkuyl 1972, the literature on aspectual composition has concentrated on a class of creation/consumption verbs where the denotation of the DP object has a direct effect

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[8]A real, but underused word of English referring to the volume by which a container is not full.

on the aspectual nature of the verb phrase as a whole. So, to recapitulate the data, in (24a), we see that a DP with homogenous reference such a mass noun or a bare plural gives rise to a verb phrase without definite temporal boundary, while a DP with bounded or nonhomogenous reference such as a singular or count term can give rise to a temporally bounded interpretation with the very same verb (24b).

 (24) (a) Michael ate apples/ice cream for an hour/??in an hour.
        (b) Michael ate the apple/five apples for an hour/in an hour.

These facts offer a tantalising analogy between the denotational properties of the object and the denotational properties of the event that it gives rise to. However, mere transference of a feature of boundedness from object to event (as in, for example, Borer 2005) is a stipulation in the absence of a genuine semantic compositional understanding of why such features can transfer not just syntactically (which we know to be possible through general 'agreement' processes), but in a semantically interpretable way from one domain to another. In fact, Krifka 1992 offers a just such an account: for a certain class of verbs the relation R between the verb and the object satisfies two crucial properties relating denotation of object and event, Mapping-to-objects, and Mapping-to-events. Given the satisfaction by R of these two properties, it can be shown that the right aspectual entailments follow. What is less often understood or emphasised by syntacticians who utilize the results of Krifka's work, is that, as he himself acknowledges, the aspectual entailments follow only for the class of verbs whose R relation has these particular properties— specifically these are just the creation/consumption class of verbs.

Returning to our verbs describing change, it is only if the nature of the change relates directly to the material extent of the object that the direct mapping between object denotation and event denotation can be found. To transfer boundedness from object to event in the general case of an undergoer is both theoretically unfounded and empirically incorrect. In other words, if the transitions are related to the object's material extent, then quantizedness will produce a telic entailment as in (24).

In fact, the creation/consumption type of transitive verb object is more similar to the notion of 'path' as found in examples with verbs of motion (25).

 (25) (a) John walked the trail.
        (b) Mary ran along the beach.

The notion of path or scale is now understood fairly well semantically and crosscuts a number of distinct cognitive domains (see Schwarzschild 2002 on measures

in general, Zwarts 2005 for spatial paths, Wechsler 2001a and Kennedy 1999 for gradable states). As Hay, Kennedy, and Levin (1999) point out, the case of creation/consumption verbs is simply a special case of some attribute of the object contributing the measuring scale that is homomorphic with the event. This property is shared by all paths, whether they are derived from the object as in the case of creation/consumption, whether they come from the scale that can be inferred from a gradable adjective or whether it is a more obvious physical path as contributed explicitly by a PP with a motion verb. Moreover, if one considers the motion verb *push* below, it is clear that path in this sense is not a species of UN-DERGOER at all, but complementary to it: in (26), the path describes the ground that the UNDERGOER traverses.

(26) John pushed the coconut along the beach.

Here the object DP, *the coconut*, is the UNDERGOER because it is experiencing the change of location, and the PP *along the beach*, is the path of motion. Logically, since the transitions are related to the object's change of location, then only the specification of a final *location* will create telicity (27).

(27) John pushed the cart to the end of the garden.

If the transitions are related to the object's change of state, then only the specification of the final relevant *state* will create telicity (28) (see Hay, Kennedy, and Levin 1999 for a detailed discussion of telicity effects with this type of verb.)

(28) Mary dried the cocoa beans bone dry in only 12 hours.

I would like to entertain the view that with the creation/consumption verbs, the DP argument does not itself travel some abstract 'path of change'; it actually *defines* the path of change, and this is why it creates quantization effects as noted in the literature.

Thus, we really need to distinguish between UNDERGOER and PATH if the differing linguistic behaviour of these objects is to be understood. We also need to separate the predicational and relational properties described here from the purely temporal notion of telicity[9]. None of these verbs is obligatorily telic; they can

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[9]The relation between temporal bound and event structure notions will be taken up in more detail in the final chapter. At that point, I will end up agreeing with Kratzer 2004 and Borer 2005 on the existence of an aspectual head related to actual temporal boundedness which sits outside the lowest (event-building) verbal domain. However, the notion of temporal bound will not be directly homomorphic with event-topological notions as described here, and which form the basis of the core participant relationships.

be interpreted as telic as a result of entailments triggered by nature of the direct object, and/or the specification of the final state in the syntax (27 and 26). I take the telicity effects in the class of creation/consumption verbs with quantized objects to be semantic *entailments* and not encoded in the lexical determination of the verb or its syntactic reflexes.

One other comment is in order concerning the nature of unboundedness. We have seen that with a creation/consumption verb, the homogenous nature of the direct object translates into an unbounded or homogenous interpretation for the event as a whole. However, this phenomenon, which is once again dependent on the semantic properties of the verbal relation, is distinct from the more general phenomenon of iterative readings, available for all verbs with plural objects.

(29) (a) John ate tv dinners for years before learning to cook.
    (b) Mary dried the dishes for hours before being released from duty.
    (c) Michael pushed the shopping carts to customers' cars all day.
    (d) Peter threw away those empty jam jars for years before he realised how useful they were.

This is, I believe, a completely independent phenomenon, as evidenced by its complete generality: the unboundedness emerges not because of the homogeneity of the core event, but because the core event is being indefinitely repeated/iterated once each for every individual within the plural set. As long as the actual cardinality of the plural object set is not determined by the context, such iteration will be unbounded. Notice that in the context of a definite number of objects (30a), or a plural object conceived of as a group (30b), the plural object can indeed be compatible with a PP requiring boundedness.

(30) (a) John dried the dishes in an hour.
    (b) Bill threw away the empty bottles in a flash.

So the effects here are not related specifically to verb type, nor to general quantizedness (just indefinite plurality). Moreover, such effects are observed with subjects as well as direct objects, with each individual in the group of plural objects determining its own event of the relevant type.

(31) (a) Tourists arrived at this pleasure spot for years.
    (b) The buccaneers attacked this island for years.

This iteration of fully formed events is a case of external aspect, which needs to be excluded when analysing the phenomenon of aktionsart or event building that will be the job of the lowest portion of the clause. These latter notions will be taken up briefly in the final chapter, when the relation to external aspect and tense is discussed.

To summarise then, we have isolated a class of verbs which represent a process or set of transitions, where one of the arguments (the UNDERGOER) is the subject of 'change'. We also isolated a class of verbs where the verbal change is directly mapped on to the material extent of the object. I called these objects PATHS, and in these cases, entailments concerning the event's boundedness arise from the boundedness or unboundedess in the material extent of the object.

However, there *are* certain verbs that behave significantly differently in being obligatorily telic, even in English. They systematically reject the *for an hour* test, in contrast to the verbs above where it is always possible to get an atelic reading.

(32) (a) John broke the stick in a second/*for seconds.
     (b) Mary arrived in two minutes/*for two minutes.
     (c) Michael found gold in just 10 minutes.

Clearly, the telicity of this class of verbs needs to be represented differently from the telicity that sometimes arises from the semantic combination of the verb, its object (whether UNDERGOER or PATH), and the presence of a final state (implicit or explicit). The claim here is that these verbs resist the atelicity test because their objects are already defined as holders of a *final* state. They don't just undergo some change, they also end up in a final state as specified by the verb itself. I will call this special type of role relation to the eventuality structure of the predicate the RESULTEE.[10]. In the sentences in (32) above: *the stick* attains a criterial identifiable change of state so that its material integrity is ruptured; *Mary* attains a locational state as determined by the deictic context; the result of Michael's actions must be that *gold* has been found. Notice that in (32c), the existence of a result, and by extension telicity, is clear even though we have used a mass term *gold* in object position. The result properties are thus properties of the verbal event structure here, not of the interaction between direct objecthood and quantization.

Thus, in terms of subevental decomposition, we need to distinguish between process or change simpliciter, and the actual attainment of a result state or telos

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[10]Notice that RESULTEES can also occur in unbounded events, if the unboundedness is created by external modification, as a part of external aspect. For example, as we saw above, a plural distributed object or subject can create an unbounded iteration of events. This phenomenon is independent of the core internal properties of the event as determining a final or result state.

(as in much recent work, e.g. Pustejovsky 1991, Parsons 1990, Higginbotham 2001). Correspondingly, the internal arguments that are the UNDERGOERS of change are distinguishable from the attainers of a final state, although it is possible (and indeed common) for a single argument to possess both properties. We have also seen the necessity of distinguishing PATHS from UNDERGOERS (or indeed RESULTEES), because these former have special transfer properties concerning the homogeneity of object and event. During this discussion we have been careful also to distinguish the effects accruing because of these primitive event role relations from iteration of events and the general availability of distributive readings for all arguments.

2.1.3   Non-Aspectual Arguments

One final class of arguments needs to be considered now. So far we have looked at participant roles that play a particular kind of relation specifying the subevental decompositions of dynamic events: the INITIATOR is the direct argument related to the causing subevent (when it exists); the UNDERGOER is the direct argument related to the process subevent; and the RESULTEE is the direct argument related to the result state (when it exists). However, not all arguments of predicates can reduce to participants of this type (I will return to PATHS again in what follows). We need to consider the arguments of stative verbs, DP arguments which do not affect the aspectual interpretation of a dynamic event in the previous ways, and also PP arguments, to complete our typology of the ingredients in the building up of the core event.

To take one obvious set of cases, the objects of stative verbs do not bear the aspectual relations of INITIATOR, UNDERGOER, RESULTEE, but have objects that further specify or describe the state of affairs. In (33), 'the fear' that 'Katherine' has is 'of nightmares' , in (34), 'the weight' in question is the weight 'of thirty pounds'. With stative verbs, there is no dynamicity/process/change involved in the predication, but simply a description of a state of affairs. The difference between the DP 'Katherine' and the DP 'nightmares' in (33) is a matter of predicational asymmetry: 'Katherine' is the theme of the predication, i.e. the entity that the state description is predicated of; 'nightmares' is part of the description itself.

(33) Katherine fears nightmares.

(34) Alex weighs thirty pounds.

This theme-rheme asymmetry is the main distinguishing semantic feature of stative predicates and the difference between subjects of statives and their predicational codas. Rhematic material in stative verbs doesn't just take the form of Verb + DP object (as in (34) and (33) above), but can also take the form of Verb + AP (35), and Verb + PP (36).

(35) (a) Ariel is naughty
      (b) Ariel looks happy.

(36) The cat is on the mat.

Given that there are no subevents to be distinguished here, and no change to be caused or culminate in any result, it is not surprising that the participant roles discussed in the previous subsections are not applicable here. However, given the existence of genuine internal DP arguments in (33) and (32), we need to acknowledge the existence of DP accusatives (at least in English) which do not bear the aspectual role relations discussed so far. These DP objects of stative verbs I will give the label 'Rhematic Objects', or RHEMES to indicate that they are not subjects of any subevent, but part of the description of the predicate. From our examination of stative predications, it is clear that RHEMES can be PPs and APs as well as DPs.

Once the existence of RHEMES is acknowledged, I would argue that they exist more generally, even in dynamic predications. Consider the verb *jog* (and others like it) in English. It is classically considered difficult for such verbs to causativise and take direct internal arguments that are undergoers (37).

(37) (a)Karena jogged.
      (b)*Karena jogged the child.

Still, it is possible for verbs of this type to take certain direct objects perfectly grammatically as (38) shows.

(38) Karena jogged 2 miles.

However, the DP '2 miles' cannot in any sense be seen as an UNDERGOER (or even RESULTEE): the entity '2 miles' does not suffer any change as a result

of the event, it remains the same but merely measures the path that the UNDER-
GOER traverses in this case. [11] In fact, any DP that describes the path of motion
in some way makes a good internal argument for a verb of motion, even when
UNDERGOER internal arguments are systematically disallowed.

(39) (a) We walked the West Highland Way.
      (b) Chris ran the Boston marathon.
      (c) We danced the merengue.

  The PATH objects briefly discussed in the previous section seem actually to
be a subcase of RHEMES. This is an important, perhaps the central subcase of
the dynamic rhematic relation: the scalar structure determined by the PATH is
monotonic with respect to the run time of the event (see Schwarzschild 2002, and
Lönning 1987 for a formal description of this notion of monotonicity) and this
seems to be a special kind ot semantic relation that licences selected complements.
For example, while manners or instruments are often important criterial factors
in distinguishing one kind of process from another, it does not appear to be the
case that manner/instrumental PPs or APs can be selected as the complement of a
process head in this way.

(40) *John pounded a hammer. (meaning John used a hammer to pound some-
      thing)
      Mary moved a hobble. (meaning Mary hobbled).

  These sentences are strikingly bad, so much so that it might not even seem
surprising. But it is nevertheless true that manners and instruments seem to be
primarily represented in verb meaning in many English verbs ('John hammered
the metal.', 'Mary hobbled to the pub.'). On the other hand, with true 'conflation'
verbs in the sense of Hale and Keyser 1993, the nominal to be conflated always
determines a path which is monotonic with respect to the run time of the event,
and can indeed also appear as a cognate object. This is never true of nouns like
'hammer' or 'hobble' because neither of them introduces a scale at all.

(41) (a) John did a dance.
      (b) John danced.
      (c) John danced a happy dance.

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[11] 'Karena' must be seen as the UNDERGOER in this sentence since she is the individual that
suffers change in location; she is also the INITIATOR since the change emerges because of her
own causational efforts. The phenomenon of unified participant roles will be discussed in the next
chapter.

The difference between PATH objects and the RHEMES we find in stative pred-
icates is analogous to the difference between locations and paths: stative verbs do
not have any part-whole structure as defined by perceptible change and hence they
are simple 'locations' and rhematic content also fails to describe any part-whole
structure; dynamic verbs are 'paths' and their rhematic objects must have a scalar
part-structure which is homomorphic with that path.

Prepositional phrases are the simplest representations of paths (in the spatial
domain canonically, with extended metaphorical and temporal uses), and the em-
pirical fact appears to be that while PP arguments systematically never fulfil the
roles of INITIATOR , UNDERGOER or RESULTEE, both DPs and PPs are avail-
able to be RHEMES. This asymmetry is what is plausibly behind the 'conative'
alternation shown in 42(a) and 42(b) below.

(42) (a) Michael ate the mango (in an hour)
      (b) Michael ate at the mango (for an hour).

While the DP argument in (42a) is a definite bounded PATH, which creates
telicity entailments with creation/consumption verbs, the PP in (42b) denotes only
an unbounded path defined by only a vague relevancy relation to the ground ele-
ment (in this case, 'the mango'); it is a PP RHEME of process but unbounded and
so giving rise to atelicity.[12]. I will use the term RHEME as a cover term for the
'ground' elements[13] in both stative and dynamic predications, but also the term
PATH for the subclass that exists only in dynamic ones.

It is also possible to argue for the existence of RHEMES of result, where the
DP in question does not 'hold' the final state, but further describes the final state.
In (43) below 'the room' expresses the final location arrived at by the subject.

(43) Kayleigh entered the room.

To summarise, it has been possible to isolate a number of different classes of
argument that form the broadest groups with respect to linguistic behaviour and
semantic entailments, especially with regard to event structure. The first major
distinction was that between the external argument and the internal one. I tried

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[12]The class of DP objects that I am calling RHEME here is the same as the class of objects that
I termed 'non-aspectual' objects in Ramchand 1997.

[13]The terms 'figure' and 'ground' are common terms in the spatial domain corresponding to
the argument structure of prepositions (see Talmy 1978), where 'ground' is basically the rheme of
the spatial predication and the 'figure' is the theme. I stick to the more general terminology here,
although the correlation should be clear.

to argue that the differences among different types of external argument were not as linguistically relevant as that basic property of externality. They all relate to the event as a whole (i.e. with its internal arguments already calculated in (see Marantz 1984 and Kratzer 1996)); they can all be described as initiators in some abstract sense; they show distinguished syntactic behaviour. Within the group of arguments classified as 'internal, I argued for a number of distinct role relations: UNDERGOERS and RESULTEES were the 'themes' of process events and result events respectively; PATHS, or RHEMES more generally were part of the event description and in the case of PATHS actually provided part-whole structure that could give rise to quantization properties on the part of the event.

In the next chapter, I will lay out the theoretical machinery that I argue makes sense of these empirical patterns.

Chapter 3

A First Phase Syntax

In the previous chapter, I argued for a small set of basic argument relations that are implicated in the linguistic construction of eventive predication. In what follows, I will tie these argument relations to a syntactically represented event decomposition. The reason for this move is the claim that the generalisations at this level involve a kind of systematicity and recursion that is found in syntactic representations. The strongest hypothesis must be that the recursive system that underlies natural language computation resides in one particular module that need not be duplicated in other modules of grammar (i.e. in the lexicon, or in the general cognitive system). At the same time, this means that the semantics that is compositionally built up by the syntax at this level can only include those aspects of meaning that are genuinely predictable and systematic— many aspects of meaning that are traditionally included in descriptions of lexical verbs (e.g. thematic roles, certain kinds of semantic selection) must be excluded. The modularity that this involves has already been acknowledged within many theories of the lexicon as the difference between grammatically relevant lexical information and more general conceptual information, although the separation has mostly been argued to be internal to the lexicon itself (Hale and Keyser 1993, Jackendoff 1990, Grimshaw 1990, Kaufmann and Wunderlich 1998, Levin and Rappaport Hovav 1995). The approach here is a little different in that the grammatically relevant information actually comes from the interpretation of the syntactic structures that the verbs participate in. There will also be differences in the specific details of the information that are argued to be present at this level.

My own proposal relates most closely in spirit to the other proposals in the literature which seek to correlate the morphosyntax and the semantics of event structure in a direct way (see Borer 2005, Ritter and Rosen 1998, Travis 2000

among others). The common idea behind these proposals is that the syntactic projection of arguments is based on event structure. However, the specific position argued for here differs from those in certain points of detail, and is more explicit about the semantics of the structures proposed. In particular, based on the informal discussion of core predicational relations and syntactic argument types in chapter 2, the event structure syntax will contain three important subevental components: a causing subevent, a process denoting subevent and a subevent corresponding to result state. Each of these subevents is represented as its own projection, ordered in the hierarchical embedding relation as shown below in (1)).

(1)   *init*P   (causing projection)

        DP$_3$
     subj of 'cause'

              init   *proc*P   (process projection)

                    DP$_2$
                 subj of 'process'

                          proc   *res*P   (result proj)

                                DP$_1$
                             subj of 'result'

                                      res   XP
                                                   $\bigtriangleup$
                                                    ...
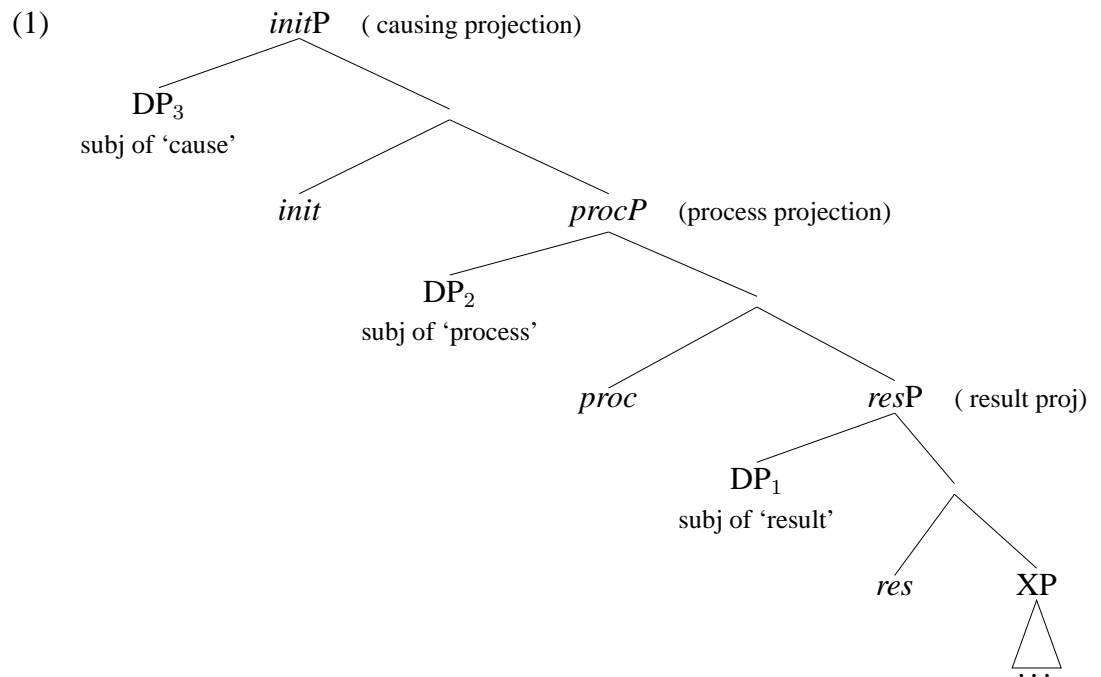
   In (1) above, I have chosen the label *init* (for initiation) to represent the outer causational projection that is responsible for introducing the external argument; in many ways it is similar to the external argument introducing *v* as invoked in the recent literature (Hale and Keyser 1993, Harley 1995, Kratzer 1996). The central projection that represents the dynamic process is called *proc*P (for process phrase). The lowest projection has been given the label *res* for result. I have stayed away from more traditional categorial labels such as V, because it is important to realise that this system is actually a splitting up of what we normally think of as V, in the same spirit as Rizzi 1997's splitting up of the C node to show its fine

structure. All three of these projections are essentially verbal, and no individual piece actually corresponds to what traditional accounts would label V: the notion of verb is always a composite which involves some or all of these elements. Also, the tree above represents the maximal possible decomposition, and a dynamic verbal projection may exist without either the *init* or *res* elements, as we will see.

Under this view, *proc*P is the heart of the dynamic predicate, since it represents change through time, and it is present in every dynamic verb. In other words, a *proc*P is present regardless of whether we are dealing with a process that is extended (i.e. consisting of an indefinite number of transitions) or the limiting case of representing only single minimal transition such as that found with 'achievement' verbs. The *init*P exists when the verb expresses a causational or initiational state that leads to the process. The *res*P only exists when there is a result state explicitly expressed by the lexical predicate; it does not correlate with semantic/aspectual boundedness in a general sense. Specifically, the telicity that arises because of the entailments based on DP structure and the verbal relation do not mean that *res*P exists unless the event structure itself is specified as expressing a result state. Conversely, the expression of result can be further modified by auxiliaries, PPs etc outside the first phase syntax to create predications that are atelic, but this will not warrant the removal of *res*P in the syntactic representation.

In addition to representing subevental complexity, as motivated by work on verbal aktionsart (Vendler 1967, Parsons 1990, Pustejovsky 1991), this structure is also designed to capture the set of core argument roles discussed in the previous chapter, as defined by the predicational relations formed at each level. In some sense, each projection represented here forms its own core predicational structure with the specifier position being filled by the 'subject' or 'theme' of a particular (sub)event, and the complement position being filled by the phrase that provides the content of that event. The complement position itself of course is also complex and contains another mini-predication, with its own specifier and complement. In this way, the participant relations are built up recursively from successively embedded event descriptions and 'subject' predications.

- *init*P introduces the causation event and licenses the external argument ('subject' of cause = INITIATOR)

- *proc*P specifies the nature of the change or process and licenses the entity undergoing change or process ('subject' of process = UNDERGOER)

- *res*P gives the 'telos' or 'result state' of the event and licenses the entity that comes to hold the result state ('subject' of result = RESULTEE) .

This idea has antecedents in the literature in the work of Kaufmann and Wunderlich 1998 who argue for a level of semantic structure (SF) which is crucially binary and asymmetrical and in which possible verbs are formed by constrained embedding.

> POSSIBLE VERBS
>
> In a decomposed SF representation of a verb, every more deeply embedded predicate must specify the higher predicate or sortal properties activated by the higher predicate. (Kaufmann and Wunderlich 1998, pg 5)

Kaufmann and Wunderlich see their SF level as being a subpart of the lexical semantics, and not represented directly in syntax, but the internal structure of their representations is very similar to what I am proposing here.

A question that naturally arises at this point is one of ontology. Why does the syntax of the first phase decompose into exactly these three projections under this view? What does it follow from, and is it logically possible to have further subevental decomposition? If not, why not? One part of the answer is sheer empirical expediency: the argument is that these projections are the ones necessary to express all and only the generalizations about verb meaning and verb flexibility that we find in natural language. So in one sense, the data drives our choice of primitives, which, though abstract and minimal, simply have to be stipulated. If they are on the right track and give a simple explanatory account of a wide range of data, as claimed, then a natural further step is to inquire what principles (if any) they follow from. The rest of this book is an attempt to provide some evidence for the explanatory power of this particular syntactic decomposition, i.e. to justify the hypothesis that these are the primitives involved.

There is perhaps another way of looking at the primitives espoused here in terms of the part-whole structure of events, which might serve to ground the intuition behind what is being proposed. If we think of a core dynamic event as representing the topological equivalent of a path, then the proposal here amounts to the claim that a verb must represent a single coherent path which can be assembled from a dynamic portion with or without endpoint and beginning point. The flanking state eventualities represented as *init* and *res* can be integrated with a process portion to form a coherent single event, by specifying its initial and final positions but no further augmentation is possible without giving rise to a separate event path. *This* is the intuition that either must be stipulated or made to follow from something deeper.

The process projection is thus the heart of the dynamic verbal event (much like the nucleus in phonologists' views of syllable structure). The bounding eventualities of 'initiation' and 'result' are related states: the former being a source, initiational or conditioning state of affairs that gives rise to the process; the latter being the end result of the process. While it is relatively easy to see that the result of a process is a 'state', it has not (to my knowledge) been claimed that the causing subevent is a state. It is not clear what the evidence for this position would be from a simple inspection of the semantics of causative verbs, since the process and the initiation/causation of an event are difficult to tease apart. However, I will assume this position in what follows, partly because it gives a simpler ontology, and also because it allows a simpler analysis of stative verbs. Any hypothesis about event structure decomposition must be evaluated on the basis of the general theory it gives rise to. I will assume that the causing subevent is a state in what follows, but leave it open that the data might require it to be any kind of eventuality more generally.

3.1 The Semantic Interpretation of Structure

An important aspect of this proposal is the claim that there is a general combinatorial semantics that interprets this syntactic structure in a regular and predictable way. Thus the semantics of event structure and event participants is read directly off the structure, and not directly off information encoded by lexical items.

The semantic approach taken here will share the intuition of the neo-Davidsonian position (Parsons 1990, Higginbotham 1985, after Davidson 1967) that event variables are a crucial element in the logical representation of sentences, and that participant roles involve separate relations between that event and each participant. Here I have taken this a little further in assuming that the event position classically taken to be associated with a single lexical item may actually be internally complex. For the semantic interpretation of this first phase syntax, I therefore adopt a Post-Davidsonian[1] semantics which interprets the verbal heads within the syntax in a regular and systematic way.

More concretely, let us examine the first relation between events argued to be important— the relation of 'causation/initiation'. The event position corresponding to a transitive verb such as 'eat' can be decomposed into two subevents

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[1]I use the term 'post-Davidsonian' to describe the theoretical position whereby verbs do not have events in their 'argument structures', but where events and subevents corresponding to the interpretation verbal heads are utilised in the expression of compositional semantic meaning.

related by causation where e_1 is the causing or instigating force and e_2 is the event of something being consumed (I follow the notation of Hale and Keyser 1993 in using $\rightarrow$ to represent the relationship between the subevents in (2)).

(2) eating (e) *where* $e = e_1 \rightarrow e_2$: [cause-eat(e_1) & process-eat(e_2)]

The second important semantic relation between events is that of the addition of a particular attained result, sometimes called telic augmentation. Once again, following much recent work (see Parsons 1990, Higginbotham 2001, Levin and Rappaport 1998), I assume that accomplishment predicates (in the Vendler 1967 sense) primitively consist of two subevents of process and telos in their representation, to create a complex event such that the process 'leads to' the result state. In (3) I show the representation of the subevents of process (e_1) and result state (e_2) as based on the notation of Higginbotham 2001 for a verbal predicate such as 'defuse the bomb'. Higginbotham uses the notation of having an event pair in angled brackets to abbreviate what he calls an 'accomplishment event structure', or a 'telic pair' (see also Pustejovsky 1991).

(3) 'defuse the bomb'(e) *where* $e = <e_1, e_2>$:[process-defuse(e_1) & result-of-defusing(e_2)

I will propose some modifications to this well known system. Because of the abstract similarity of the 'leads-to' relation to the one invoked in attaching the causing subevent, I will use the same notation for telic augmentation and claim that indeed the same semantic combinatoric process is involved. In addition, a verbal predication like 'defuse the bomb' also encodes a causational or initiational element and the decomposition actually encodes not just two, but three subevents, as shown in (4) below.

(4) 'defuse-the-bomb'(e) *where* $e = e_1 \rightarrow (e_2 \rightarrow e_3)$:[initiate-defuse(e_1) & process-defuse(e_2) & result-of-defusing(e_3)]

A number of further comments are in order. The causal embedding '$\longrightarrow$' relation is the only primitive of the event combinatorial system which can be used to create complex events of the same logical type– the hierarchical order of the embedding gives rise to the difference between causational semantics or resultative semantics. Subevents themselves are not of a different ontological type from macro events— out of combination they are of the same order as simple processes or states. The macro-event corresponding to a predication is just an event which

happens to have sub-parts. For some linguistic purposes (anchoring to tense, adverbs and intersentential effects) this event is the only event variable manipulated or 'seen' by the logical relations. However, the evidence from aspectual semantics and internal morphology of verbs indicates that eventive sub-structure is linguistically real and follows certain strict syntactic and semantic generalizations.

For concreteness, I lay out here how the general semantic combinatorial system works to interpret this kind of syntactic structure. I take particular nodes in the first phase syntax tree to denote relations between properties of events and properties of events, constructing more and more complex event descriptions. Under this more 'constructionist' view, neither events nor individual entities are arguments of the lexical item itself, but of the predicates introduced by the semantic interpretation of particular categorial nodes; however, like the neo-Davidsonian position, events and individuals are never all co-arguments of the same predicate, and they are discharged in different ways.

To reiterate, there is a basic primitive rule of event composition in this system, the 'leads to' relation:

(5) Event Composition Rule:
   $e = e1 \rightarrow e2$: e consists of two subevents, e1, e2 such that e1 causally implicates e2
   (cf. Hale and Keyser 1993)

There are two general primitive predicates over events corresponding to the basic subevent types as follows:

(6) a. State(e) : e is a state
   b. Process(e): e is an eventuality that contains internal change

I am assuming that both the initiational eventuality and the result eventuality are states, and that their interpretation as causational or resultative respectively comes from their position in the hierarchical structure. In particular, in the *init* position, the state introduced by that head is interpreted as causally implicating the process; in the *res* position, the state introduced by that head is interpreted as being causally implicated by the process. We can therefore define two derived predicates over events based on the event composition rules.

(7) $\exists e_1, e_2[\text{State}(e_1) \, \& \, \text{Process}(e_2) \, \& \, e_1 \rightarrow e_2] \longrightarrow_{def} \text{Initiation}(e_1)$

(8) $\exists e_1, e_2[\text{State}(e_1) \, \& \, \text{Process}(e_2) \, \& \, e_2 \rightarrow e_1] \longrightarrow_{def} \text{Result}(e_1)$

Further, the objects of particular event types are interpreted according to the primitive role types defined as the relations between objects and events below:

(9) a. Subject (x, e) and Initiation(e) entails that x is the INITIATOR of e.
    b. Subject (x, e) and Process(e) entails that x is the UNDERGOER of the process.
    c. Subject (x, e) and Result(e) entails that x is the RESULTEE.

Using lambda notation for convenience, I spell out the denotations of the different pieces of structure, showing how they can be made to combine systematically to produce the required interpretations. The important point here is not the denotations in terms of lambda notation, but the idea that this dimension of skeletal semantics can be built up independently merely from the specification of the interpretation of pure labelled structure, *in the absence of lexical encyclopedic information*.

The *res* head in the first phase syntax is interpreted as building a state description that has a particular 'holder' in its specifier position. Its semantic interpretation is given below:[2]

(10) $[[\ res\ ]] = \lambda P\lambda x\lambda e[P(e)\ \&\ res\text{'}(e)\ \&\ \text{State}(e)\ \&\ \text{Subject } (x,e)]$

When the *res*P is selected by a process-introducing head, *proc*, the Holder of the state is then the holder of a 'result'. I have labelled this special type of holder RESULTEE. The interpretation of the process-introducing head *proc*, is given below. It takes an argument in its specifier position that is interpreted as the UNDERGOER of the process, and a state description in its complement position that is interpreted as the result state (by (11)):

(11) $[[\ proc\ ]] = \lambda P\lambda x\lambda e\exists e_1,e_2[P(e_2)\ \&\ proc\text{'}(e_1)\ \&\ \text{Process}(e_1)\ \&\ e = (e_1 \rightarrow e_2)\ \&\ \text{Subject } (x,e_1)]$

Finally, once the whole *proc*P is formed, the highest verbal head *init*, is interpreted as an initiating event which leads to the (possibly complex) event constructed by the lower structure that it combines with. The specifier position of this projection is interpreted as the INITIATOR of the subevent:

(12) $[[\ init\ ]] = \lambda P\lambda x\lambda e\exists e_1,e_2[P(e_2)\ \&\ init\text{'}(e_1)\ \&\ \text{State}(e_1)\ \&\ e= e_1 \rightarrow e_2\ \&\ \text{Subject } (x,e_1)]$

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[2]In the formulas that follow, *res'*, *proc'* and *init'* stand in for the lexical encyclopaedic content contributed by the result, process and initiation heads respectively depending on the particular lexical item that projects.The association to lexical content is discussed in section 3.2

3.1.1   Rhematic Material

Now we must turn to RHEMES as discussed in the previous chapter and where they fit in this structural event semantics. We have seen that certain aspectually relevant arguments are related in a one-to-one fashion to the projections corresponding to each subevent— they are the 'subjects' or 'specifiers' of those projections. Rhematic material, by hypothesis will never occur in the specifier position of an eventive head; it will always occur in complement position to an eventive head. RHEMES, and as an important subcase PATHS, do not describe elements that are predicational 'Figures' within an event topology, but those that actually construct the 'Ground' or landscape within which other things (the 'subjects') are being located (using and extending the terms 'Figure' and 'Ground' from Talmy 1978).

The proposal is the following. While the *proc* head can combine felicitously with a whole *res*P to create a telic pair, it can also take a simple PP or DP in its complement position. In that case, the PP or DP does not determine its own independent subevent, but acts as a further modifier or descriptor of the *proc* event. In the terms of Higginbotham 2001, *res*Ps combine with the *proc* head by 'telic pair formation' while DPs and PPs will combine by event 'identification', to further describe the properties of the relevant subevent.[3]

The structures at issue here are those that have the form as in (13) below.

(13)   *init*P
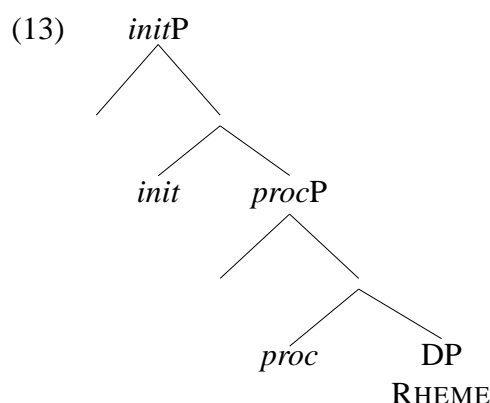
In this case, there is no separate event introduced, but the rhematic material further describes the event already introduced by the process head. The Rhematic relation however, is not completely open or vague; certain wellformedness conditions on event-event correspondences must hold if an XP Rheme is to be interpreted as being 'identified' with a particular event. My proposal for Rhemes of

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[3]In this sense, the DPs I am interpreting as RHEMES are similar in spirit to the 'predicate modifiers' of de Hoop 1992.

process builds on the formalism and intuitions regarding 'paths' and the material objects of creation/consumption verbs. The intuition is that a rhematic projection (in complement position) must unify with the topological properties of the event: if the event is dynamic, the complement must also provide a topologically extended structure. In the case of directed paths that can be measured, the measure of the 'path' increases monotonically with the change expressed by the verb; in the case of (complement) Rhemes to stative projections, that Rheme must crucially *not* involve a path structure. More specifically, DP/NP Rhemes must provide structure in terms of the part/whole-structure of their material constituency when combined with a dynamic event. Of course, rhematic elements are not just NPs, they can also be PPs and APs. In each case, however, the rhematic projection denotes an entity whose essential properties determine a scale which can be measured. PP Rhemes represent locational paths which are mapped on to the dynamic event (Zwarts 2003), and AP Rhemes provide a gradable property scale which functions as the mapping to the event-change path (see Wechsler 2001a for a claim along these lines). My claim is that the complement position of a process head is associated with the semantic relation of structural homomorphism, regardless of the category of that complement. The homomorphism has been noted before in different domains, and given formal representation. Here, I wish to offer a formal characterization that unifies the different cases that have been noted in the literature.

Let us take the cases in turn. With the well known class of creation/consumption verbs, Krifka (1987) introduced two basic principles, Mapping to Objects and Mapping to Events, which enforced a homomorphism between the part structure of the object and the part structure of the event. This mapping ensured that quantized objects gave rise to bounded events, for example. It corresponds to the intuition of the object providing a 'measure' of the event. For Krifka, not every thematic relation between verb and object satisfied those mapping properties, i.e. they were properties of certain thematic relations only. In our case, we are claiming that the relation holds with DPs in object position of the process head, and not of UNDERGOERS more generally. Examples of this kind of relation include verbs like *eat*, or *draw* or *build* where the quantization effect can be seen.

(14) (a) Michael ate porridge for 10 minutes/??in 10 minutes.
       (b) Michael ate the apple for 10 minutes/in 10 minutes.

However, as Krifka himself points out, it is not always all parts of the object that are relevant.

As an example, consider *eat the apple* and *peel the apple*; in the first case, all the parts of the apple are involved, whereas in the second case, only the surface parts are. Another example is *read the book* and *burn the book*; surely there are parts of the book which are relevant in the second case (e.g. the cover of the book) which do not count as parts of the book in the first case. To handle these phenomena, we may assume that the verb selects specific *aspects* of an object (e.g. only its surface). Krifka 1987, pg 45.

Because of this variability, I will not formalise the mapping relation as directly mapping between the mereological part-structure of the event and the mereological part structure of the object. Instead, the mapping will be between the part-whole structure of the event and a set of 'measures' of a particular property which is monotonic with respect to the part-whole structure of the object. Schwarzschild (2002) makes this distinction as well in his study of the measure phrases possible with nominals— a measure can take a DP complement mediated by the preposition *of* only if it measures a property that is monotonic with respect to the part-whole structure of the object.

(15) (a) Two gallons of water/*twenty degrees of water.
      (b) twenty grams of gold/*twenty carats of gold.

This is determined strongly by the part-whole structure of the nominal itself in some essential way, but can also be affected by context. Thus, in the context of measuring for a recipe, *15 grams of breadcrumbs* is grammatical and measures weight. but in the context of Hansel and Gretel leaving a trail, *3 miles of breadcrumbs* also works and measures length. The important thing is that the property be monotonic in the important sense.

Now while all measurement systems mirror the degree to which an entity has the property in question, some but not all mirror as well the intuitive part structure of the stuff being measured. For example, if a quantity of oil has a certain volume, then every proper subpart of it will have a lower volume and superparts will have larger volumes. On the other hand, if the oil has a certain temperature, there is no reason to expect that proper parts of it will have a lower temperatures. We will call a property **monotonic** if it tracks part-whole relations. (Schwarzschild 2002, pg 2.)

We need also to unify this case with the more spatially straightforward cases of paths, where PPs create a path homomorphic with the process of change described by the verb. The boundedness of the PP path in this case gives rise to a temporally bounded event.

(16) (a) Karena walked to the pool in 10 minutes/*for 10 minutes.
       (b) Karena walked towards the pool *in 10 minutes/for 10 minutes.

The exact relationship between the preposition and the denotation of the object of that preposition in constructing a path is not at issue here (but see Zwarts 2003 for details). The important thing is that a PP denotes a path which can either be bounded or unbounded (noncumulative vs. cumulative respectively, according to Zwarts 2003), and there is a relation between it and the verb which is homomorphic. In Zwarts' terms this homomorphism is expressed by means of a trace function of an event which tracks its spatial location.

(17) $[[V\ PP]] = [\ e \in [[V]]: \text{Trace}(e) \in [[PP]]\ ]$

However, if we wish to unify the spatial paths with the objectual paths, the Trace function is not sufficiently general. Rather, to unify the cases, I will exploit an idea that was necessary in Schwarzschild's analysis of measures.

> A system of measurement is one in which elements of an ordered set of measurements, a scale, are assigned to a domain of entities, based on some property. The goal is for the ordering of the measurements to reflect the extent to which entities in the domain have the property in question. (Schwarzschild 2002)

Nominals or PPs do not themselves denote a scale, though they do give rise to one. We need to assume a function which takes us from the denotation of the NP/PP to some scale. In the cases of PP paths that scale is something like 'distance from an initial point', in the case of an NP it might be 'volume' or 'degree of completedness'. Let us assume that this property is determined by pragmatic selectional restrictions, the only constraint on it being that it is monotonic in Schwarzschild's sense (extending his notion to paths, as materially extended locational entities). In the case of adjectives, the null Prop function is not required since, plausibly, adjectives denote properties directly.

(18) $\text{Prop}_{mono,\ C}$ (x) is the property determined by x and the selectional context C, which is monotonic on x.

Now, we need to determine a related set of measures, d, based on Prop_{mono}, C (x), which are all the possible measurements of the property in question based on the part-whole structure of the entity, given by the relation notated here as $\subset$.

(19) Let μ be a function which gives a measure of P.
Let D = { d $\in$ μ(Prop(x)): $\forall$ x' $\subseteq$ x μ(Prop(x')) = d }
Let $\leq$ be a relation that determines a linear order on D, such that if μ(Prop(x1)) = d1 and μ(Prop(x2)) = d2, d1 $\leq$ d2, iff x1 $\subseteq$ x2.

μ and $\leq$ will exist if the property in question really is monotonic with respect to the part-whole structure of the entity. Let us call a set of ordered measures in this sense for an entity, x, D_x (where entities include both objects and extended locations).

We are now ready to define the relation between this set of measures and the verbal event, when the rhematic/complement relation holds. We define a thematic role PATH, which is the relation that holds between an entity and an event, if a monotonic property of that entity is monotonic with respect to the part-whole structure of the event as well. I will express this formally, in the spirit of Krifka (1987), as 'Measure-to- Event Mapping' and 'Event-to-Measure' Mapping.

(20) PATH(x, e) $=_{def}$ $\exists$R$\exists$D$_x$[$\forall$e,d,d'[R(e,d) & d' $\leq$ d $\rightarrow$ $\exists$e'[e' $\subseteq$ e & R(e',d')]
(mapping to measures) &
$\forall$e,e',d'[R(e,d) & e' $\subseteq$ e $\rightarrow$ $\exists$d'[d' $\leq$ d & R(e',d')] (mapping to events)

In the case of adjectival phrases in rhematic position, the adjective denotes a property directly[4], and the measure is the degree to which the property holds. We will see in the next chapter that the difference between closed scale or open scale gradable adjectives corresponds to resultativity in certain constructions (after Wechsler 2005). This will lead us to assume that the path relation also applies to APs in rhematic position.

Thus, in the case of the *proc* head combining with an entity (either an individual, a spatial path, or a property), instead of which a predicate of events, the interpretation is as follows.

(21) [[*proc*]] = λyλxλe[Path(y,e) & *proc'*(e) & Process(e) & Subject(x,e)].

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[4]I follow Chierchia and Turner 1988 in assuming primitive ontological status for properties, too, as a type of entity.

In the case of the *result* head itself, we can also have rhematic elements. But because the *result* head denotes an event without any part-whole structure (it is a state), rhematic complements of *res* will be constrained to be 'place' locations rather than 'path' locations, single non-gradable properties, or a single entity where no part-whole structure is relevant. Here the DP will have to give rise to an unchanging property as determined by its denotation, selectional restrictions and context.

The structures being proposed here embody a primitive difference between the combinatoric semantics of the specifier position with the head, as opposed to the complement position and the head. Put in informal terms, the specifier syntactic position always introduces a 'Figure' or 'Theme' related to the subevent denoted by the head; the complement position is never a 'Figure', but rather the 'Ground' or 'Rheme' of a particular subevent. With respect to properties which are homomorphic to the part-whole structure of the event, rhematic DP objects are related by properties which are also homomorphic to their own part-whole structure. Arguments in specifier position are also related to the event, but via the relation of predication, and the property that they are ascribed by virtue of predication is never constrained to be monotonic with respect to their part-whole structure.

I summarize the basic argument relations given by the primitives of this system including the composite roles that will be derived by Move, together with some illustrative examples (a detailed discussion of different verb types can be found in chapter 4).

INITIATORS: are the individuated entities who possess the property denoted by the initiational subeventuality, which leads to the process coming into being.

 (22) (a)*The key* opened the lock.   PURE INITIATORS
        (b) *The rock* broke the window.
        (c) *John* persuaded Mary.
        (d) *Karena* drove the car.

The differences among the different initiators in the sentences above are due to the different lexical encyclopedic content of the verbs in question, and to the referential/animacy properties of the DP argument. By hypothesis, they are not related to structural position.

UNDERGOERS are individuated entities whose position/state or motion/change is

homomorphically related to some PATH. UNDERGOERS are 'subject' of process, while PATHS are complements of process.

(23) (a) Karena drove *the car*.   PURE UNDERGOERS
      (b) Michael dried *the coffee beans*.
      (c) *The ball* rolled.
      (d) *The apple* reddened.

(24) (a) Katherine walked *the trail*.   PATHS
      (b) Ariel ate *the mango*.
      (c) Kayleigh drew *a circle*.
      (d) Michael ran *to the store*.

RESULTEES (Figures of result) are the individuated entities whose state is described with respect to the resultative property/Ground.

(25) (a) Katherine ran *her shoes* ragged.   PURE RESULTEES
      (b) Alex handed *her homework* in.
      (c) Michael threw *the dog* out.

GROUNDS of Result possess an inherent non-gradable property which describes the result state.

(26) (a) Karena entered *the room*.   GROUND OF RESULT
      (b) Kayleigh arrived *at the station*.

UNDERGOER-INITIATOR is a composite role which arises when the same argument is the holder of initiational state *and* holder of a changing property homomorphic with the event trace of the *proc* event. (This is represented using the copy theory of movement.).

(27) (a) *Karena* ran to the tree.   UNDERGOER-INITIATORS
      (b) *The diamond* sparkled.
      (c) *Ariel* ate the mango.
      (d) *Kayleigh* danced.

The example (27b) represents Levin and Rappaport-Hovav's class of internally caused verbs, the (a) example is a motion verb which classically exhibits mixed behaviour with respect to unaccusativity diagnostics. The (c) example deserves special mention because it is a case where the INITIATOR of the eating event is

also somehow experientially affected by the process in a way that is only possible with animate/sentient causes. Because of this, we will see that the class of UNDERGOER-INITIATORS includes many cases of so called Actors or volitional Agents in the literature (see the next subsection for further discussion). RESULTEE-UNDERGOER is a composite role which arises when the same argument is the holder of a changing property homomorphic with the event trace of the *proc* event, *and* the holder of the result state.

(28) (a) Michael pushed *the cart* to the store.
     (b) Katherine broke *the stick*.
     (c) Ariel painted *the house* red.

3.1.2 Agents and Experiencers: The Special Case of Mental States

So far, I have been describing participant relations in terms of objectively observable causes, changes and effects where intuitions seem more secure. However, initiation, process and result are claimed to be the abstract structuring principles behind all eventive predications and are intended to cover changes and effects in more subjective domains as well. Traditional thematic role systems often make a special case of Volitional Agents and Experiencers (Butt 1995, Belletti and Rizzi 1988), and the feature of mental state is one of the primitives used by Reinhart 2002 in her lexicalist theory of argument structure ([+m]). Crosslinguistically, animacy hierarchies play an important role in the syntactic realisation of participant relations (see Ritter and Rosen 1998), and there is general cognitive evidence that humans interpret causational and affective relations differently when there are participants who possess sentience and will involved. I do not wish to deny the reality of these effects, but I propose to account for them without introducing additional heads or 'flavours' of initiational projections. Rather, I will argue that humans reason about sentient participants differently from the way they reason about inanimate objects and that this allows sentient creatures to participate in a wide variety of FIGURE roles for subevents by virtue of their internal/psychological causes and effects, i.e. they don't have to be physical effects.

Often, the entailments of a particular participant differ systematically according to whether an animate or inanimate DP is in argument position, without any obvious change in the syntactic form of the verb phrase. In (29), the rock is a pure 'cause' or 'instrument', but John can be a volitional agent. In (30), the lever undergoes a physical change of orientation, while John is affected purely psycho-

logically. In the latter case, the lexical encyclopedic content of the verb *depress* must be consistent both with physical and psychological motion 'downward' as a part of a pervasive analogy between physical and mental effects.

(29) (a) The rock broke the window (*deliberately).
      (b) John broke the window (deliberately).

(30) (a) Mary depressed the lever.
      (b) The weather depressed John.

The point here is that animate/human referring DPs have the option of being interpreted as volitional causers, as willful controllers of a process and as experiencers of static or changing mental states. For every sub-predication type and role type in specifier position that I have discussion in this section, I speculate that there is an analogue in the psychological domain. For the stative subevents, it is clear what those interpretational inferences are: psych INITIATORS are 'intentional'; psych RESULTEES are experientially affected.

The case of the process projection is an interesting one. I have claimed that the UNDERGOER is the individuated entity who possesses/experiences a varying property that runs homomorphic with the run time of the event. In the case of someone sentient this could be the case of continuous experiencing of the process in a relevant way. I will claim that psychological involvement in a process such as that of continuous experience is also one way of being an UNDERGOER. Basically, the difference between pure 'Causes' and actual 'Actors' will be that an 'Actor' is related to both initiation and process (which may or may not lead to a result), whereas 'Cause' is a pure specifier of INITIATION. The psychological version of a pure cause is an 'intentional initiator', the psychological version of 'actor' is a volitional agent with continuous experiential involvement in the process.

Thus, in this system I do not make use of 'flavors' of the initiational head in a feature based sense, nor do I separate a causational head from an agent introducing one (as in the system of Pylkkänen 1999) to account for the different types of 'subject'. There are two distinct dimensions for accounting for differences in the entailment properties of different subject types: the first involves the difference between pure INITIATORS and UNDERGOER-INITIATORS, the latter of which are continually involved in the process and are represented as such; the second dimension is that of encylopedic content either via the verb's own lexical encyclopedic information or through the perception of the referential properties of the DP participant (animate vs. inanimate).

3.1.3   Stative Predications

Finally, a word about stative verbs is in order here. The way the system is being built up so far, a stative verb cannot have any *proc* element in its first phase syntax, or any UNDERGOER argument, but only RHEMATIC or non-aspectual internal arguments. I will assume that stative verbs therefore consist simply of a *init* projection, with rhematic material projected as the complement of *init* instead of a full processual *proc*P. Since the *init* does not have *proc*P as its complement in this case, it is not interpreted as causational, but simply as a state. If there is an internal argument, it is in complement position and serves to further describe the state (without any path structure). The subject of *init*P is then straightforwardly interpreted as the holder of the state. Thus, a sentence such as the following (31) would correspond to the first phase syntax as shown in (32).

(31) Katherine fears nightmares.

(32)
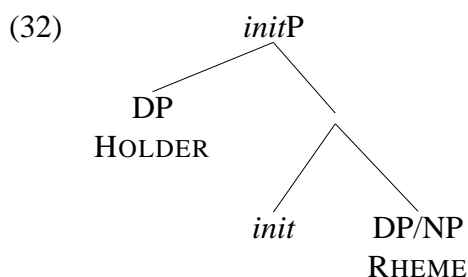
Notating the first phase syntax of statives as '*init*' is not strictly necessary, since we could simply assume an independent verbal head corresponding to an autonomous state. However, I have unified the ontology because of the similarities in behaviour between verbal statives and verbal dynamic verbs. Specifically, if we assume (as in one popular current view) that *init* (or rather, its analogue, *v*) is the locus for the assignment of accusative case as well as the licensing of an external argument (as per Burzio's Generalisation), then statives are clearly verbal in this sense and have the equivalent of a little *v* head in their first phase syntax.[5] Representing statives in this way also utlises the ontology proposed here to the full— all possible combinations of heads and complements are attested and

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[5]Here I leave open the issue of where one needs to distinguish 'unergative' from 'unaccusative' states, or whether that might correlate with the property in question being internally determined by the 'holder' (an individual level property) or simply an accidental or contingent property of that 'holder' (stage-level). It may well be that these differences also need to be structurally represented, but a detailed investigation is beyond the scope of this book.

give rise to the different verb types we find in natural language. In particular, the phenomenon of *Rheme* nominal complements to V heads (in complementary distribution to RPs) exists side by side with *Rheme* nominal complements to *init* heads (in complementary distribution to *proc*Ps).

To summarize, given the semantics of these various categories proposed here, if the structures are not built up in the correct order, the derivation will at best converge as gibberish. Given the existence of a functional sequence then, whose order is forced by the semantic interpretation rules, we can assume that the syntactic structures are freely built up by Merge, but as we will see in the next section, they will have to be licensed by the presence of specific lexical items.

3.2 Integrating the Verbal Lexical Item

What has not yet been discussed is the relationship between this abstract functional structure of the first phase and the actual lexical items which instantiate it. In being explicit about this part of the theory, a number of choices have to be made concerning 'insertion' versus 'projection', and the nature of the features that the lexical items carry. Insertion models assert that the lexical item inserts under a particular terminal node (presumably according to the lexical item's category specification), and other features on the item must perform the job of 'selection' if the broader context of insertion is to be sensitive to that particular item. A projection model (such as the Minimalist Program) does not make a distinction between a terminal node and a lexical item that it dominates, but assumes that the lexical item itself becomes a 'terminal' of the syntactic representation if it is the minimal element on a projection line which bears that category feature. In the latter kind of model, the lexical items derive the syntactic structures by their projection properties. As with lexical insertion, a mechanism is still needed to ensure that the generalisations about certain selectional properties are to be met. Implementing a system of ensuring 'selectional' properties are met is the most difficult part of the current enterprise, and the problem is equally difficult whether one uses an insertion or a projection model. The difficulty is twofold: establishing which selectional properties of verbs should really be built in as part of the computation; establishing a mechanism to implement selection which does not involve serious departures from the mechanisms already admitted into the theory for independent reasons. In the first phase syntax that was described in the previous section, the category label for Verb has been decomposed into *init*, *proc* and *res* and it is no longer clear what the position of Merge (or insertion) should be. However, be-

cause these categories have a systematic semantic interpretation, many of the differences among verb types that seem linguistically potent, are directly correlated with the existence or non-existence of these projections in the first phase. Taking the event structure and argument types discussed earlier as the fundamental natural classes gives a more pared down and abstract set of selectional properties than the traditional thematic role labels. It means that much of the selectional burden can fall on category features themselves, provided that we ensure that certain lexical items project certain particular subsets of these features. If selection can reduce to feature checking of category labels (cf. Svenonius 1994a) then we do not need to invoke specialised features or mechanisms for the purpose. I will adopt a projection model for convenience, although nothing serious should hinge on this decision.

In the semantic rules given in the previous section, the specific content of the process or result or initiation is left open, indicated in the formulae above in the positions *init*', *proc*' and *res*', presumably to be filled in with the lexical content of verbs themselves. At the same time, this association of lexical content to the syntactic structure cannot be completely free, since as we have seen, there are limits to argument structure and event structure flexibility of lexical items.

Over the past forty years, linguists have used the notion of 'selection' (c-selection or s-selection) to describe a wide variety of different data and phenomena across languages. In a system like the Minimalist Program (Chomsky 1995, Chomsky 2000, Chomsky 2001), where syntactic structures are built up by Merge and Move derivationally, subject only to principles of full interpretation at the interfaces, the effects of c-selection can only be achieved by means of feature checking. Thus, it would be a clear deviation from minimalist principles if a special subtype of features— selectional features— needed to be invoked to deal with these kinds of cooccurrence generalisations among linguistic elements. In the approach taken here, categorial features and features that are independently required for interpretability are the only ones that will be invoked (cf. also Pesetsky and Torrego 2001). The categorial features we need for the first phase syntax proposed above are the category features of the three eventive functional heads (*init*, *proc*, *res*). They are in principle *interpretable,* since they are the features that trigger the semantics of event composition, and are required for the proper interpretation of the first phase syntactic structure, which I assume is simply the domain of event building.

The view of the lexicon I will be promoting in what follows is that each lexical item is bundle of information in radically different modalities (phonological, articulatory, syntactic, conceptual and even personal/associational) in some kind

of memorised association. In terms of meaning, the lexical item contributes a huge store of conceptual and encyclopaedic content, but it is the syntactic feature information that allows that content to be accessed and deployed within a linguistic computational system. So instead of seeing the lexical item as a structured syntactic entity that projects its information unambiguously to create syntactic representations (the structured lexicon view) , I am proposing a view by which the syntax and a basic templatic semantics is built up autonomously, as one tier or dimension of meaning (a constructionalist view), and the association to lexical content provides the other tier or dimension of meaning. Unlike the constructionalist views of Marantz 1997b, Borer 2005, the lexical item is not devoid of syntactic information, and it does not appear at the bottom or 'root' of the syntactic tree. Rather, it associates its lexical-encyclopaedic content via those category features that form part of its information bundle. Specifically, a lexical item with an *res* feature can project the *res* feature to form an *res*P predication, but it also carries lexical encyclopaedic content which can identify the content of the state in question; a lexical item with a *proc* feature can Merge as *proc* and has the nature of the process specified by its encylopaedic content; a lexical item with a *init* feature can Merge as *init* and identify the nature of initiational conditions involved. From this discussion, it should be clear that a particular lexical item can carry more than one of these features in any particular case.

Thus, the first phase syntax is freely built up by Merge, subject to the interpretational principles at the interface. Merge of syntactic features in the wrong order will create gibberish at the interface. To make selection work, lexical items must carry a particular bundle of categorial label tags which allow particular first phase configurations to be built. The idea is that the category labels or 'tags' on lexical items are the only information necessary to regulate their use, and moreover the minimal nature of the syntactically relevant information they have will be part of the solution to 'flexible' lexical use within a language. Since the lexical item may carry more than one category tag, it must therefore multiply associate to different syntactic heads (within the same phase). This seems to call for some equivalent of head movement, although head movement does not actually capture the intuition that the verb is a single lexical item that can project more than one category label. In addition, there are well known technical issues with head movement in current minimalist theorising (violation of the Extension Condition (Chomsky 2000) being the most obvious). Instead of pursuing a technical solution, I will simply drop the assumption that lexical items 'insert' under a single terminal node (see also Starke 2001), or that the initial Merge position is somehow privileged. Instead, elements may Merge and project and then Remerge in the sense of Starke 2001 at a

later stage of the derivation. Remerge is a conceptually cleaner version of the copy theory of movement. If Merge of two elements is conceived of as set formation, then nothing prevents a particular item from being a member of more than one set. Remerge simply takes that idea seriously by creating a new association line without going through the redundant step of making a copy. Sometimes in what follows I will represent Remerge using copies, since it represents the same relationships more perspicuously, even though I do not actually believe that copies are necessary. As far as I am aware, Remerge has not been used explicitly for 'heads'. It becomes a possibility in this system because lexical items have more than one category label. Intuitively, this is the technique by which a a single item can be associated to more than one position simultaneously[6].

If all that is specified by the lexical item are the category labels, how are the number and nature of arguments established? Perhaps very little needs to be said explicitly about this, in fact. As we have seen, specifier positions are interpreted systematically by the general semantic component as: INITIATOR, UNDERGOER and RESULTEE respectively. There are thus no thematic roles in this system, only three universal semantic rules triggered by syntactic structure. Another major departure this proposal makes from other systems is that these specifier positions are not claimed to be mutually exclusive. In other words, it is possible for a single argument to be in more than one of these positions simultaneously (or have them linked together in an A-chain). This means that I am assuming that there is no Θ-Criterion, and that the semantic interpretations of the positions so linked get unified. In principle, there is no incompatibility between the semantics of INITIATOR, UNDERGOER, RESULTEE, and so no violations will occur purely because of unification. The simplest assumption is that all the projections of the first phase require a filled specifier (in other words, the information about who is the holder of the result state, who is the undergoer of change and who is the initiator need to be specified whenever *res*P, *proc*P or *init*P exist, respectively). In this way, the existence of a particular category will force the existence of the relevant specifying participant. However, because of the possibility of filling those positions by either Merge, or Remerge (Move), one further condition needs to be stated: lexical items appear to impose a requirement concerning whether the specifier positions made available by the subevental heads are filled by distinct nominal projections, or by

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[6]Using a principle like Remerge (or Copy Theory) immediately gives rise to the question of the linearisation of the elements that are in more than one 'position'. For the purposes of the data examined at this level of the clause, it seems enough to say that the spell out of an item corresponds to its 'highest' position in the syntactic representation. However, this may need to be complicated for higher levels of the clause.

the same nominal projection. This amounts to stipulating for each category label *init*, *proc* or *res*, whether it is a *raising* head or not. We will see when we examine the different verbal types in English, that this possibility is something that seems to vary according to the lexical item itself. At this point, I will remain agnostic about whether this information is part of real world knowledge, something that needs to be specified in addition to the category information, or something that follows from more general principles. For convenience, I will notate this possibility by coindexing the category labels on the lexical items in question, as a way of indicating that the specifier positions of the two projections are filled by the 'same' DP. This is a weakening of the position that the only thing that needs to be present on the lexical item is category label features, but as I see it so far, an unavoidable one.

To make this discussion more concrete, I illustrate a sample derivation of a verb like *push* below. I assume that *push* is a verb which is specified as [*init*, *proc*]. In other words, it has lexical encyclopaedic content that identifies a process/transition as well as conditions of initiation. The *push* verb will Merge with a DP in its specifier and project its *proc* label. Since it also has an *init* feature, *push* can now be Remerged with *proc*P, which now projects the *init* label. This new syntactic object now Merges with the specifier to project a *init*P. The semantic computational rules at the interface will interpret this as a process of change characterised by translational motion of which DP$_2$ is the undergoer, and DP$_1$ is the initiator, specified as possessing the physical force properties to put such translational motion in train.

(33)

```
              initP
             /    \
          DP₂      \
                  /   \
              init    procP
              push    /   \
                   DP₁     \
                          /   \
                       proc    XP
                     ⟨ push ⟩
```
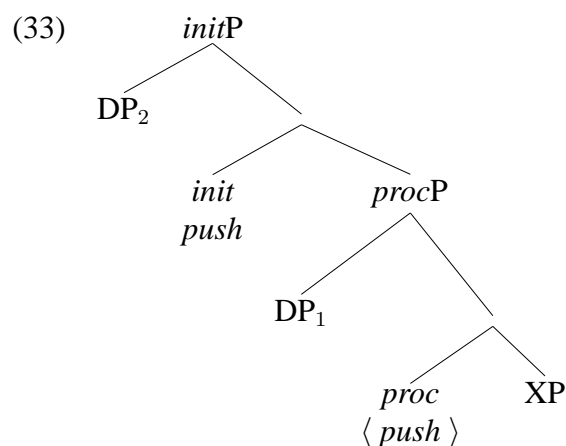
In this example, there is no PATH overtly specified, so I assume that the complement of the process head is filled in by a contextual variable (let us call this Y_c

for concreteness). In addition, the lexical encyclopedic content of *push* fills in the content for the process event.

(34) $[[\overline{proc}]] = \lambda y \lambda x \lambda e[\text{Path}(y,e) \ \& \ push(e) \ \& \ \text{Process}(e) \ \& \ \text{Subject}(x,e)].(y_c) =$
      $\lambda x \lambda e[\text{Path}(Y_c,e) \ \& \ push(e) \ \& \ \text{Process}(e) \ \& \ \text{Subject}(x,e)]$

The DP argument in specifier now Merges with $\overline{proc}$ to form a *proc*P, giving:

(35) $[[\ procP \ ]] = \lambda x \lambda e[\text{Path}(Y_c,e) \ \& \ push(e) \ \& \ \text{Process}(e) \ \& \ \text{Subject}(x,e)] \ ([[\ DP_1 \ ]]) = \lambda e[\text{Path}(Y_c,e) \ \& \ push(e) \ \& \ \text{Process}(e) \ \& \ \text{Subject}(DP'_1,e)]$

Finally, once the whole *proc*P is formed, the highest verbal head *init*, is interpreted as an initiating event and the lexical verb Remerges to identify the the content of the initiational subevent.

(36) $[[\ \overline{init} \ ]] \ (\ [[\ procP \ ]]) = \lambda P \lambda x \lambda e \exists e_1, e_2[P(e_2) \ \& \ push'(e_1) \ \& \ \text{State}(e_1) \ \&$
      $e = e_1 \rightarrow e_2 \ \& \ \text{Subject} \ (x,e_1)] \ (\lambda e[\text{Path}(Y_c,e) \ \& \ push(e) \ \& \ \text{Process}(e) \ \&$
      $\text{Subject}(DP'_1,e)])$
      $= \lambda x \lambda e \exists e_1, e_2[\text{Path}(Y_c,e_2) \ \& \ push(e_2) \ \& \ \text{Process}(e_2) \ \& \ \text{Subject}(DP'_1,e_2)] \ \&$
      $push(e_1) \ \& \ \text{State}(e_1) \ \& \ e = e_1 \rightarrow e_2 \ \& \ \text{Subject} \ (x,e_1)]$

DP$_2$ now Merges as the specifier of the initiation phrase to create a fully formed *init*P, which is a predicate of events (with internal complexity).

(37) $[[\ initP \ ]] = \lambda x \lambda e \exists e_1, e_2[\text{Path}(Y_c,e_2) \ \& \ push(e_2) \ \& \ \text{Process}(e_2) \ \& \ \text{Subject}(DP'_1,e_2)]$
      $\& \ push(e_1) \ \& \ \text{State}(e_1) \ \& \ e = e_1 \rightarrow e_2 \ \& \ \text{Subject} \ (x,e_1)]([[\ DP_2 \ ]])$
      $= \lambda e \exists e_1, e_2[\text{Path}(Y_c,e_2) \ \& \ push(e_2) \ \& \ \text{Process}(e_2) \ \& \ \text{Subject}(DP'_1,e_2)] \ \&$
      $push(e_1) \ \& \ \text{State}(e_1) \ \& \ e = e_1 \rightarrow e_2 \ \& \ \text{Subject} \ (DP_2,e_1)]$

We will consider a range of verbs of other types from English in the next chapter.

Another important constraint on the syntactic expression of participant relations that I will assume here without much comment is Case Theory. I assume that Case is an important component of the grammar, probably checked after the first phase of the syntax is complete, but providing a constraint on that first phase syntax, since I will assume that only two arguments can be licensed by structural case in natural language. I will assume that *init* is the head that is responsible for the assignment of internal structural case, and that the I inflectional head (or some decomposed element of it) is responsible for the assignment of nominative.

Thus, in the descriptions of the verb types in English that follows in the next section, there will never be more than two arguments licensed in specifier positions, even though there are in theory (at least) three positions made available by the event structure template I have assumed. The phenomenon of the double object construction is a separate one, and will be dealt with in the next chapter.

Chapter 4

Deriving Verb Classes

Given the outlines of the system presented so far, we can use the primitives at our disposal to discuss the different natural classes of verb that emerge from this kind of syntactic organisation. I will use English as the empirical base, since the verb types within it have received a lot of attention in the literature, and because it is particularly rich in variably behaving verbs. By taking seriously the event structure participanthood of arguments, I aim to show that a somewhat different classification of verb types emerges. In addition, the system I am arguing for will allow flexibility in a verb's syntactic behaviour, within a general system of constraints. Importantly, some of the previous principles of mapping between lexical information and syntax assumed in the literature will be abandoned. This is inevitable, since syntactic theory itself has changed, particularly in admitting finer and finer decompositions of lexical categories. Because this is a constructional system, the wide variety of different verb types and role types will be derived from the different combinatoric possibilities within the system of basic event structure syntactic primitives.

4.1 Initiation-Process Verbs

In this section, I examine the argument structure of verbs which have an initiation component as well as a process component. Because they already contain a representation of causation, they do not causativize in English; because they contain no result phrase, they do not possess an obligatory final transition. However, within these limits, there are still a number of different possibilities offered by the system. First of all, we must distinguish verbs in which the INITIATOR and UN-

DERGOER are distinct from ones in which the INITIATOR and UNDERGOER are
filled by the same DP constituent. Secondly, we need to distinguish genuine UN-
DERGOER arguments from those which are 'rhematic' PATHS/MEASURES within
the process phrase.

4.1.1   Transitives

Verbs like *push*, *drive*, *dry* (transitive), *melt* (transitive) *redden* (transitive) each
contain some DP which is conceived of as the initiator of a dynamic event, where
the second DP is represented as undergoing a change. In the case of *push* and
drive, the DP object undergoes a change of location. In the case of *melt* or *redden*
the change is that of some (non-inherent) property of the object. In each case, the
lexical encyclopædic content of the verb identifies both the initiational transition
as well as the process and thus is listed as an [init, proc] verb.

   With respect to UNDERGOER arguments, the event path must always be iso-
morphic with some varying property of the object. This property is not inherent to
the object, and does not have to be monotonic with respect to its part-whole struc-
ture. Rather, it is a property that the object possesses (possibly incrementally),
purely by virtue of participation in the event. The endpoint of event is identified
with final stage on the property scale achieved by the object. Examples of verbs
with UNDERGOER objects are shown in (1) below, and given a phrase structural
representation in (2).

   (1) (a) John pushed the cart.
        (b) Mary drove the car.
        (c) Michael dried the cocoa beans.
        (d) The sun melted the ice.
        (e) The clown reddened his cheeks.

(2)   *init*P

    John

        init   *proc*P
        push

             the cart

                proc XP
              < **push** >
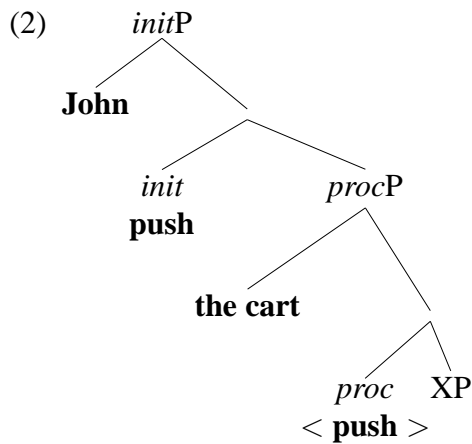
There are, in addition, some transitives in this category whose direct objects are not UNDERGOERS, but PATHS. While there is still a relation between the process and the DP in question, the difference lies in whether the DP is construed as definitional of the process itself, or whether it is simply a 'traveller' or 'trajector' of the path. In the latter case, we have the UNDERGOER relation and the homomorphism to the event established by a contingently changing non-inherent property of the DP. In the case of the PATH, the property that is mapped on to the process is an inherent one of the DP and does not itself change; rather, the homomorphism to the process of the event is established via the scalar structure of that inherent property. In the case of PATHS the process is defined by its progress through the scale contributed by the object; in the case of UNDERGOERS, the DP's existence is independently established and it possesses varying degrees of a property as a result of the event. This class of verbs having PATHS of process includes the classic consumption verbs such as *eat* and *drink*. Because these objects are *Paths* and because the path that is homomorphic to the process is correlated with the material extent or degree of coverage of the object, quantization effects occur and the boundedness of the direct object translates directly into temporal boundedness of the process.

Thus, the semantic generalization concerning PATHS is that the event path is homomorphic with some monotonic property of the entity denoted by the DP (where a monotonic property is defined as in Schwarzschild (2002) as tracking the part-whole structure of the entity. Examples of verbs with PATH DP objects are shown in (3), and given phrase structural representation in (4).

(3) (a) John read the article.
    (b) Mary ate the mango.

(c) Michael walked the trail.

(4)   *init*P
          /   \
       Mary
              /   \
          init   *proc*P
          eat   /   \
                < Mary >
                          /   \
                      proc   DP
                   < eat >the mango
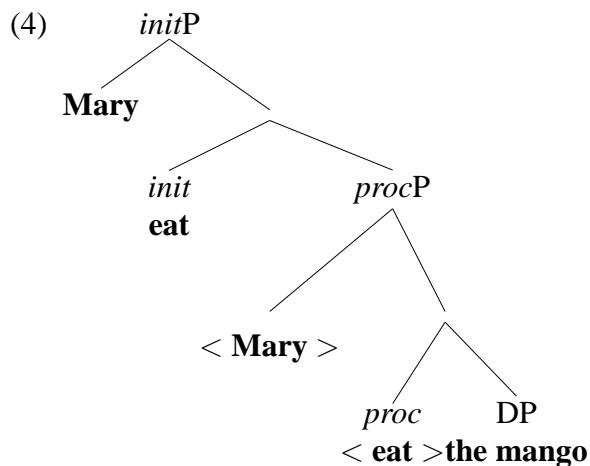
Note that here we have to assume that the UNDERGOER position in the spec-
ifier of *proc* is not itself filled by the direct object DP. Given the discussion in
the previous chapter concerning sentient agents, it could be that the DP argument
'Mary' itself fills this position in addition to the INITIATOR role, because of her
status as continuous experiencer of the process. We will see in the chapter on
causativization, that certain subjects of 'ingestive' verbs in Hindi/Urdu show very
clearly that they class as 'affected' in addition to being initiational. The alterna-
tive for English would be to relax the requirement that all specifiers of subevental
projections be filled at some stage of the derivation. Such a relaxation would
require further specification on the roots (e.g. a specification which forces the
non-projection of a specifier). In the interests of theoretical parsimony, I will ten-
tatively assume that for these verbs in English with rhematic objects, the subject
argument is always an UNDERGOER-INITIATOR.[1]

As further evidence for the rhematic/complement status of a certain class of
DP objects, McIntyre points out that direct objects and PP rhemes do not cooccur

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[1]This predicts that rhematic object verbs will require 'actors' (sentient or otherwise) but never
allow pure 'causes'. There is some suggestive evidence that this might be the case. See also Folli
and Harley 2004 for the first discussion that I am aware of of these kinds of contrasts.

(5) (a) John ate the apple.
     (b) *Rust ate the drainpipe.
     (c) Rust ate (away) at the drainpipe.

The (c) example above is fine, suggesting that the conative construction has a rather different
structure, although I leave a detailed analysis to further research.

for many verbs. This is when the DP in question is itself is 'rhematic' and occupies the same position as a PP 'path'. As McIntyre (2002) puts it, the existence of an 'event path' disrupts the ability of the normally selected DP object to be linked, in certain cases. This is predicted under the present system where both DP rhemes and PP paths occur in the complement position of the process head. (examples from McIntyre 2002)

(6) (a) I read through the book.
      (b) I saw (*Mary) into the window.
      (c) I rang (*the number) through to her.

(7)

```
               initP
          ╱          ╲
     Karena           ╲
                  ╱        ╲
               init         procP
               ring      ╱        ╲
                     ╱               ╲
              < Karena >              ╲
                           ╱               ╲
                        proc    the number/through to her
                       < ring >
```
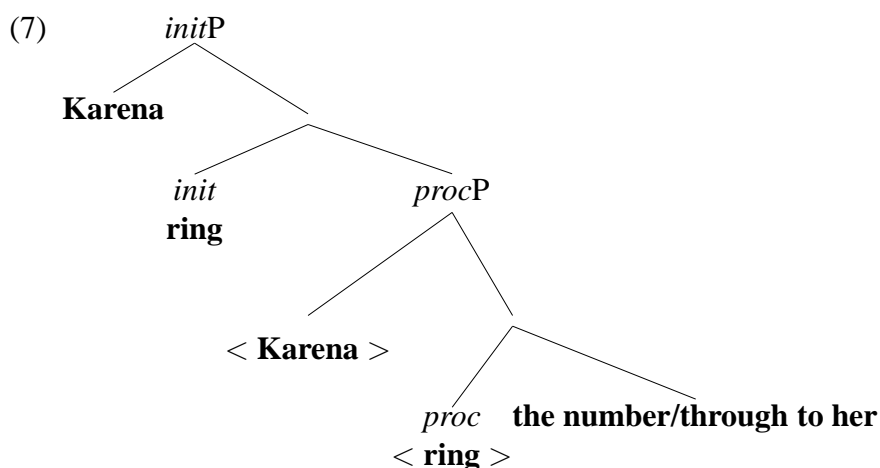
However, this is not the case with all verbs that can take PP 'event paths'. In cases where PP paths do cooccur with direct objects, the direct object is an UNDERGOER and the PP is interpreted as path travelled by that UNDERGOER.[2] Thus, this is an important test for the difference between UNDERGOER and PATH DP objects.

(8) (a) John pushed the cart to the store.
      (b) The sun dried the leaves to a crisp.

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[2]We will see that the PP path can either simply be a rhematic PP complement to *proc*, or more deeply embedded within a result projection, depending on whether it describes the trajectory of the UNDERGOER or whether it names its final location. I will ignore these differences here, but take them up again in chapter 5.

(9)   *init*P
        /   \
   John
              /   \
          init   *proc*P
          push   /   \
                  the cart
                          /   \
                      proc   XP
                    < **push** >   /\
                                to the store
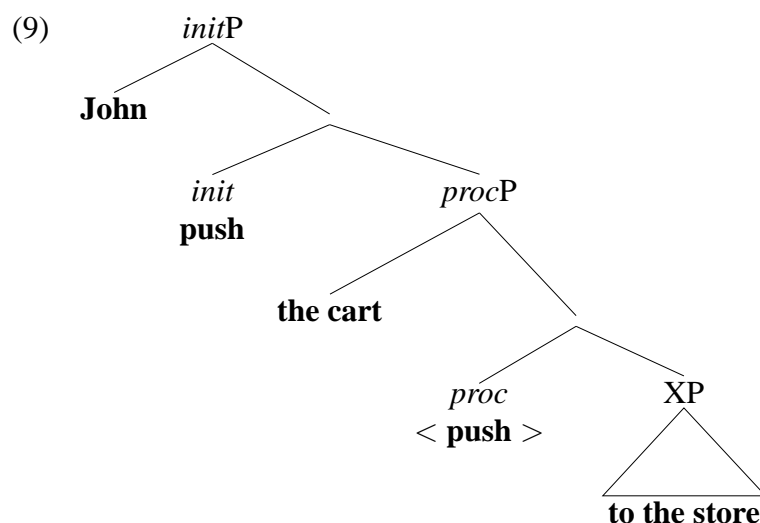
The class of creation verbs is interesting to examine here because phrases like *bake DP*, or *paint DP* seem to be systematically ambiguous between a reading in which the verb simply describes the process of an individuated UNDERGOER argument (the (b) examples below), or a completive verb with a DP object that comes into being, thus simply describing the 'result' (the (a) examples).

(10) (a) John baked the cake.
      (b) John baked the potato.

(11) (a) John painted a picture.
      (b) John painted a wall.

In the (a) examples above, the dynamic event is defined by the process of 'baking' or 'painting' and is complete when the DP in question comes into being. In the (b) examples, the dynamic process expresses a change that the DP (already in existence) undergoes. Thus, in the former cases the DP is a PATH of process (12) with 'John' experiencing the process, but in the latter it is a specifier (UNDERGOER) of process (13).

(12)   *init*P

  John

     init   *proc*P
     bake

        < **John** >

             proc   DP
            < **bake** >

                 a cake

(13)   *init*P

  John

     init   *proc*P
     bake

       the potato

             proc   XP
           < **bake** >
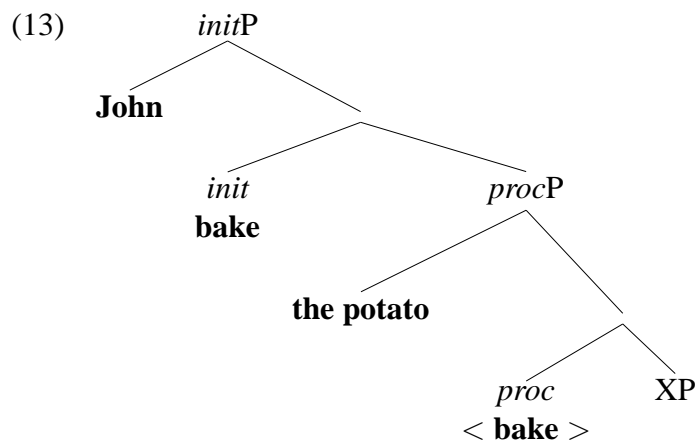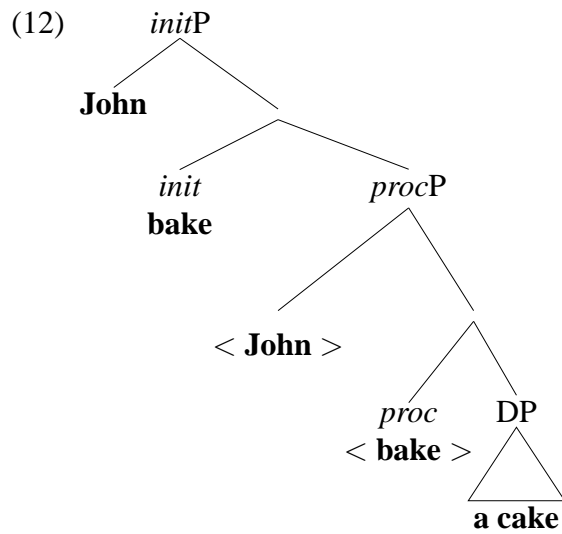
The entailments in the two cases are different. DP undergoers allow resultative secondary predication, while DP rhemes do not.

(14) (a) *John painted a picture red.
     (b) John painted a wall red.

In English, the addition of free datives (constrained in English to 'creation' verbs (cf. Levin 1993) is felicitous only under the 'creation' interpretation of the DP, not an UNDERGOER interpretation.

(15) (a) John painted me a picture.
     (b) ??John painted me a wall.

Certain adverbials like ' a little' go well with UNDERGOER objects, but are strange with RHEME objects.[3]

(16) (a) ??John painted the picture a little.
     (b) John painted the wall a little.

What we can see about the verbs in this class is that there is considerable flexibility in the syntactic frames in which the verbs can occur (DP vs. PP rheme; DP undergoer vs. XP rheme). Thus, these verbs should be specified with respect to the elements in the functional sequence they can identify, and not with subcategorization frames per se. On the creation reading, the quantization of the DP rhematic object gives rise to a bounded interpretation of the event, much like in consumption verbs.

Turning now to processual verbs in the domain of motion, the example of *push* is instructive.

(17) Lexical Entry for *push*: [init, proc]

Because the lexical verb is associated with the identification of both the initiation head and the process head, it contributes lexical encyclopaedic content to both: it gives information about the kinds of actions required to initiate a pushing event (some sort of initiating impulse) as well as what constitutes undergoing a pushing (translational motion, not of own accord). Note that if these semantic selectional restrictions of the root are not met, the result is infelicity, i.e. the event cannot be described as a 'pushing'. If John causes the cart to undergo translational motion by forcing Mary to shove it with her elbow, then we cannot describe that as 'John pushed the cart'. If gravity caused the cart to move down the hill, (18a) is nevertheless infelicitous. If (18b) is going to work, the stone needs to be already conceived of as rolling or moving of its own accord, not pushed or guided by something/somebody else.

(18) (a) ?? The earth tremor pushed the cart down the hill.
     (b) ?The stone pushed the cart over the bridge.

General abstract causers are indeed possible in subject position for many verbs in English, depending on the lexical verb. I take the strong semantic selection

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[3]These data are pointed out for Spanish in Batsiukova 2003, and Batsiukova also points out that the same constraint seems to apply to the Russian attenuative/semelfactive suffix *nu*.

restrictions on the subject position of *push* here to be an indication of the fact that *push* lexically encyclopaedically identifies the initiation component, and is does not merely specify the nature of the process.

Given the existence of different positions within the verbal projections, it is technically possible for both specifier and complement positions related to the process head to be present, although it seems that an UNDERGOER DP and a PATH DP do not cooccur in this class. One possibility, mentioned earlier, is that this is related to case requirements: accusative case is plausibly related to the relationship of a DP to the process event and in particular is licensed when the DP is connected to the path structure. Given that both UNDERGOERS and PATHS have this mapping property, only one DP of this type would be possible.

4.1.2 Intransitives

Within the group of verbs that identify both initiation and process, we also find some intransitives. This is a logical possibility of the system, whereby participant relations can in principle be composite. Recall that different 'thematic roles' are not completely distinct monolithic entities but arise because they are constituted differently from the different syntactic positions in a relational structure and composed via Move. In this particular case, an intransitive [init, proc] can arise when a single DP occupies both UNDERGOER and INITIATOR position. These verbs have a single DP argument which undergoes change, but also which is self-initiating. A large class of motion verbs in English conform to this description.

(19) (a) Alex ran.
  (b) Katherine danced.
  (c) The soldiers marched.
  (d) Michael swam.
  (e) Karena jogged.

The INITIATIOR component of these verbs can be identified by the fact that they do not causativize (20). [4]

(20) (a) *Michael ran Karena.
  (b) *Alex danced Ariel.

---

[4]As we will see in the next chapter, a distinct direct object is indeed possible with these verbs, but only when an additional position is made available by an extra predicational information corresponding to 'result' or 'path'.

(c) *The lieutenant marched the soldiers.
(d) *Karena swam Kayleigh.

While a transitive version containing separate INITIATOR and UNDERGOER is not possible with these verbs, PATH objects are in principle possible and are perfectly grammatical, indicating once again the difference between UNDERGOERS and PATHS both structurally and semantically.

(21) (a) Michael ran the race.
      (b) Ariel danced a waltz.
      (c) Kayleigh swam her way into history.

Crucially, the subject argument preserves the entailments of UNDERGOER as well as INITIATOR because the DP in question undergoes a change in position/location as a consequence of the activity. When a path phrase is added, the subject DP is the one that is asserted to travel along that path (22).

(22) (a) Karena jogged to the coconut tree.
      (b) The soldiers marched around the block.
      (c) Katherine danced around the room.

(23)

```
            initP
          /      \
     Karena       \
             /       \
          init       procP
          jog       /     \
              < Karena >    \
                        /      \
                     proc     XP
                   < jog >
```
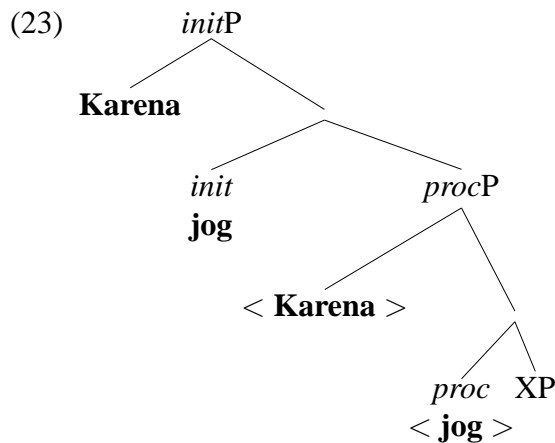
Thus, these verbs differ from *push* in that the DP that fills the specifier of the process projection is the same as the DP that fills the specifier of the initiation projection— in derivational terms, the higher specifier projection is filled via Move, not first Merge. Once again, it is unclear to what extent this needs to be expressed directly in the lexical entry of the verbs in question. In principle, it

could be real world knowledge that tells us that 'walking' is the kind of activity that is self-initiated. If the lexical encyclopedic constraints are relaxed, by convention, the requirement that the INITIATOR and the UNDERGOER be identical can be suspended as in (24a,b).

(24) (a) Katherine walked the dog.
      (b) Michael ran the water/the meeting/Mary's life.

Note that the possibility of composite roles has so far been restricted to adjacent specifier positions. If we consider a verb like *walk* which can also occur with a PATH direct object, as in (25), we predict that there could not be an intransitive version of this whereby the PATH roles and the INITIATOR roles are unified (26). This in principle could also be a semantic compatibility rather than a constraint on Remerge.

(25) Karena walked the trail.

(26) *The trail walked.

There also seems to be a deep difference between the way in which we conceptualize animates, and particularly humans, in describing events and assessing causation. The fact of having a sentient initiator seems to be an important semantic selectional restriction for many lexical verbs. As we have seen, the fact of having intentions and desires is an salient causational factor in events. In particular, animates can be 'subjects' of process just in virtue of the fact that they are experientially continuously affected by it.

It may be that considerations such as animacy and real world knowledge are sufficient to constrain the various conflation possibilities here, but if we were to take these restrictions on role composition/conflation seriously and wish to notate them in the verb's lexical entry, then we would need an extra diacritic to distinguish the intransitive verbs in this section from the transitive ones where INITIATOR and UNDERGOER are distinct. For convenience, I will use subscripting to indicate the difference between these two possibilities— the lexical entry for verbs of the *run* type will have the init and proc features co-subscripted to indicate identity of specifiers, while still leaving it open that this might not have to be notated on that lexical entry.

(27) Lexical entry for *run*: [init_i, proc_i].

The syntactic decomposition proposed here also has repercussions for subsequent anchoring to tense, although importantly I am assuming that no tense variables are present at this level of composition. The event-topological requirements for building macro events from subsituations seem to be fairly strict: the initiation subsituation and the process must be related temporally, up to a tolerance of complete overlap; process and result must also temporally overlap at the transition point, although here the result state must completely follow the process. It is the transition into process that provides the left boundary of the event from the purposes of anchoring to tense. Similarly, the transition out of process into a result state (as given by the semantics of the *res* head) provides the right boundary of the event and will be relevant once we consider the embedding of the complex event in a system of temporal interpretation. We will see that the nature of the lexical identification of the different subevents can give rise to different temporal entailments for the same event hierarchies within this general set of constraints. The important point at this stage is that time is a logically distinct distinct variable from the event variables and their causational relationships, and that it is an empirical issue how the one should be embedded within the other.

4.2   Initiation-Process-Result Verbs

There are a number of verbs in English that seem independently able to identify the result state of a process. I will argue that these include the transitives such as *break*, *throw*, *find*, *explode enter*, and intransitives such as *arrive*, *disappear*.

4.2.1   Transitives

Taking the transitives first, the idea is that the transitive verb *break* encodes both an causational initiation by a DP subject (the 'breaking') as well as a final result of the DP object becoming 'broken'. For this kind of verb, the DP object is both the UNDERGOER of the process as well as the RESULTEE, and the verb identifies the content of all three causationally related subevents. This is shown in (28) below.

(28) Katherine broke the stick.

```
                    initP
            /              \
     Katherine              \
                    /              \
                 init            procP
                break         /         \
                      the stick          \
                               /              \
                            proc              resP
                          < break >       /         \
                                  < the stick >       \
                                              /            \
                                            res            XP
                                         < break >
```
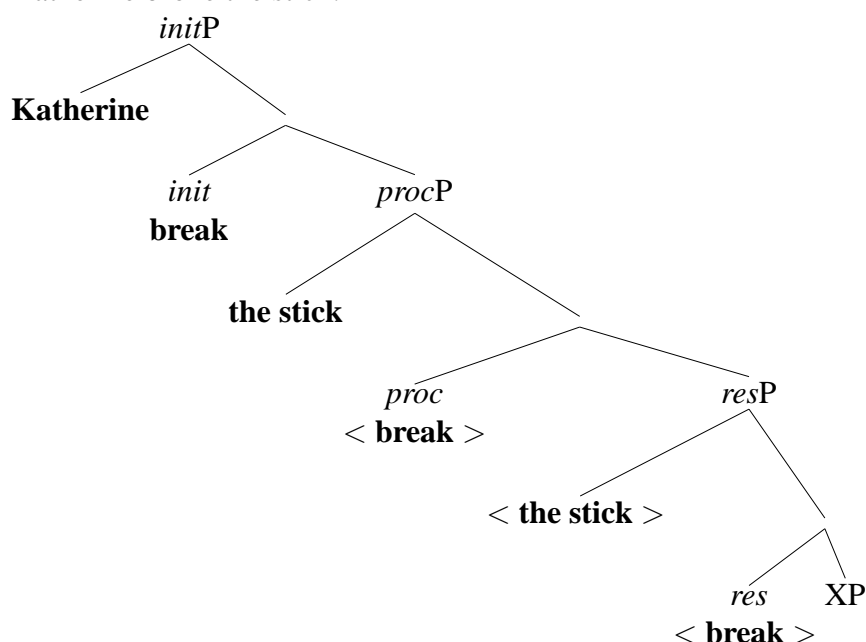
The verbs in this class encode a *Res*P, as diagnosed by the fact that they can take simple locative prepositions as the rhematic complement of *res*, to describe the final result (29).

(29) (a) Katherine broke the stick in pieces.
     (b) Ariel threw the ball on the ground.
     (c) Alex stuck the picture on the wall.

In each case the DP object undergoes the verbal process to end up in the final state or location as described by the locative PP— e.g. the 'ball' in (b) gets 'thrown' and ends up 'on the ground'. The possibility of a non-path/locative phrase describing the result of the action is dependent on the existence of the *res* head whose semantics ensures that this is the way the property or state is connected to the rest of the eventuality. Note that this contrasts minimally with the process verbs in the previous section, which consistently allow path PPs with directional prepositions (30a), but are not grammatical with simple locatives expressing result (30b). I will take up these cases in more detail in the next chapter.

(30) (a) *Kayleigh pounded the metal in pieces.
     (b) Kayleigh pounded the metal into pieces.

Verbs like *find* and *enter* are a little bit different in that their DP objects are not undergoers of the process or holders of any result state, but are rhematic DPs describing the final result. When Ariel 'enters the room', it is 'Ariel' who is the INITIATOR of a process which she herself is the UNDERGOER of, and where she bears the RESULTEE role of attaining the final location described by the GROUND DP, 'the room' in (31).

(31) Ariel entered the room.
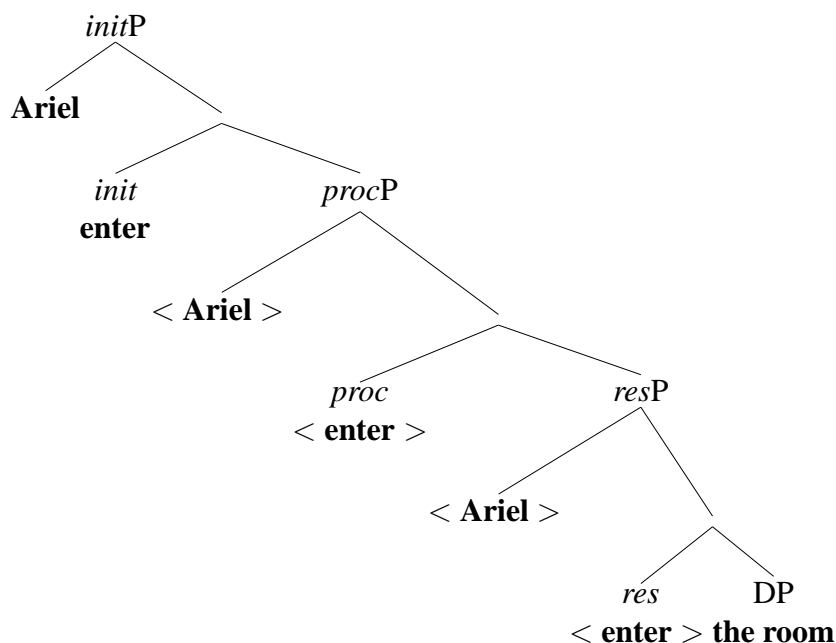
This latter type does not form explicit resultatives because the rhematic position is already filled by the DP object, but they are like the previous [init, proc, res] class in that they are incompatible with 'for an hour' in English (32).

(32) (a) *Katherine broke the stick for two minutes.
      (b) *Michael hit the stick for two minutes.
      (c) *Alex exploded the balloon for two minutes.
      (d) *Ariel entered the room for two minutes. (on the intended reading)
      (e) *Kayleigh found the gold for two minutes.

One other important diagnostic for the presence of *res* in the lexical specification of a single verbal item is the way that the event structure is subsequently

anchored to tense. We have seen, in the previous section, that a verb that identifies an initiation transition as well as process seems to impose a cotemporaneity requirement on the initiational subpart of the eventuality with the process portion. When a single lexical item identifies both proc and res, as in the verbs seen so far above, the event expressed is punctual. I hypothesize that this is because when a single tense carrying verb identifies both an initiational state and the result state, the two must be interpreted as overlapping. This means in turn that the process portion is reduced to a single instantaneous change.

The classification that is emerging here bears some resemblance to, but is distinct from, many of the aktionsart features and classifications in the literature. It is important therefore to be explicit about the ways in which this system differs from others, while still capturing the basic intuitions of previous work in this area. One of the crucial points to note about this system is that it makes a principled distinction between the event building portion of the clause, and the temporal interpretational portion of the functional sequence. At the event building (lowest) portion of the clause, causational and predicational structures are built up, independent of tense. The verbs that contain [init, proc] could be seen as the ones that have traditionally be described as 'activities' in the terms of Vendler (1967), or [+durative] [−bounded] in terms of aspectual features (citations). While the traditional 'activity' verbs do indeed belong to my class of [init, proc] verbs, there are however [init, proc] verbs which would traditionally be called accomplishments. In fact, all of the accomplishments— the ones which embody duration as well as boundedness— are [init, proc] verbs. This is because temporal boundedness in my system can arise from bounded paths in the complement position of the *proc* head, or can even arise from real world knowledge in the case of the so-called degree achievements of Hay, Kennedy, and Levin (1999). In other words, *res*P is not necessary for boundedness in the temporal sense; it is an element of causational substructure and gives rise to its own predicational entailments and is not the locus of telicity.

On the other hand, the [init, proc, res] verbs are classic punctual verbs, or achievements in Vendler's terms. The most crucial feature is therefore duration: verbs which identify a non-punctual process (whether bounded or not) have to be those which do not simultaneously identify process and result. Conversely, an 'achievement' interpretation is achieved when a lexical verb identifies both process and result. It is not logically necessary given the presence of all three of *init*, *proc* and *res*, that the result should be an achievement, however, it only results when a single lexical item carries all three features, with only one tense specification.

4.2.2   Intransitives

As with the previous class, intransitives also exist in the group of [init, proc, res] verbs despite the three specifier positions made available by the event building substructure. This is because, as we have seen, roles can be composite. In this subclass of verbs are punctual achievements such as *arrive* and *fall*. Even though these verbs have traditionally been considered to be 'unaccusative', this is because of their obligatory telic character and their monotransitivity. I see no English internal reason for ascribing a verb like *arrive* to the class of verbs that has no initiation component.[5] Rather, the single DP argument of a verb like *arrive* involves self-initiation (whether volitional or not), and these verbs do not causativize.[6] Because of the punctuality facts and the lack of causativization, I will analyse a verb like *arrive* as containing a single DP argument which initiates its own transition to a final locational state— it is simultaneously the INITIATOR, UNDERGOER and RE-SULTEE. Moreover, because the verb identifies all three heads in this functional decomposition, the resulting predication is punctual (33).

---

[5]I am assuming that the 'there'-insertion test in English is not a diagnostic for unaccusativity, but rather is related to independent constraints related to locative existential predications. Further, the diagnostic related to acceptability when used as a prenominal participle, I assume is conditional on the UNDERGOER relation of the head noun to the participle, which does exist for *arrive* in my terms, due to role composition.

[6]I will consider the causative/inchoative alternation explicitly in the next section.

(33) Michael arrived.

```
                        initP
            Michael
                      init          procP
                     arrive
                            < Michael >
                                    proc          resP
                                   < arrive >
                                            < Michael >
                                                      res    (XP)
                                                     < arrive >
```
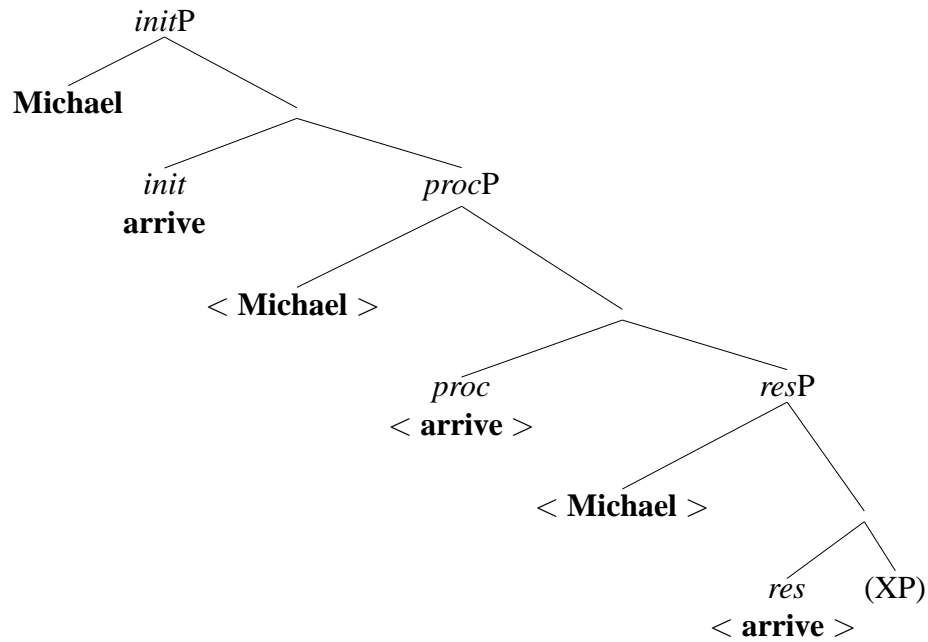
The class of 'semelfactives' as isolated traditionally in the literature (see Smith 1991) also fall into this category. These are the punctual intransitives such as *jump*, *hiccup*, and *trip*. The INITIATOR of the activity is also the UNDERGOER, and moreover, there is also particular final transition achieved by that argument, so it is also a RESULTEE. We can see that a locative (place) PP can indeed get a result interpretation with these verbs, showing that *res* is licensed by this verb.

(34) Katherine jumped in the lake/on the table.

Therefore, in the absence of an explicit place PP, the result of a semelfactive of motion must be the covering or a particular distance to a final location, by jumping. Seen in this way, the single argument of *jump* must also be in RESULTEE position.

(35) Kayleigh jumped in the lake.
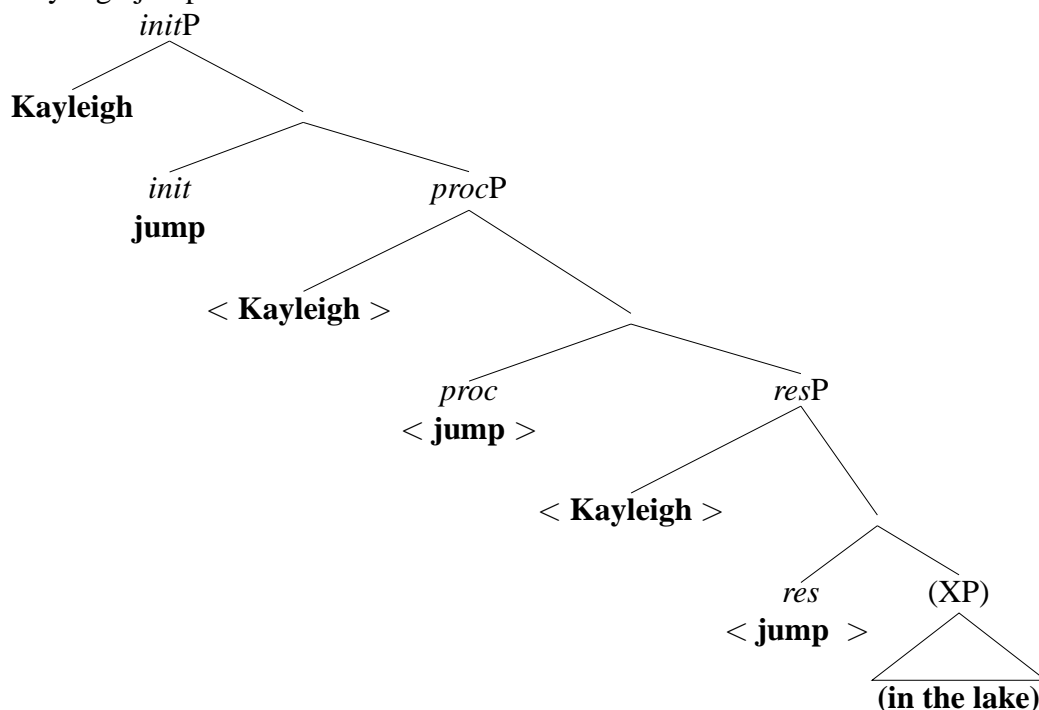
Not surprisingly, the fact that the verb *jump* identifies both *proc* and *res* means that it, just like achievements, and verbs like *break*, will be punctual. On the other hand, the defining fact about semelfactives is that they also systematically give rise to a durative, indefinitely iterated reading, in which case they are atelic. While Smith 1991 argues that semelfactives should be treated as a separate class, that of 'atelic achievements', this position has been criticized by Rothstein 2004, who argues that semelfactives are basically telic punctual events which are joined via 'S-Summing' to give the durative, indefinitely repeated version.

The definition of S-summing is given in terms of a system of event mereology represented as as lattice as in Link 1983. S-summing is simply the join of individual events to form a larger one. However, the most important fact about S-summing is independent of the lattice algebra used: the operation is only defined when the event atoms are such that the start point and the final point are identical (see also Kamp 1979 for this idea). This property allows events to be S-summed 'seamlessly' without any temporal or spatial gaps. Crucially, other kinds of event concatenation, like habituals or iteratives proper, do not have this property, and this is what makes the semelfactives special.

I will therefore assume that the basic first phase syntax of semelfactive verbs is as shown in (34) above. One possible analysis is that the durative reading is a result of S-summing which is a higher aspectual operator outside the first phase. This analysis is the one that is most congruent with the one given in Rothstein 2004, if we were to give her semantic S-summing operator a position in the syntax.[7] The disadvantage of this is that it obscures the difference between genuine iterativity, which is possible for all dynamic events, and is blind to the internal structure of the first phase, with this special class of semelfactives whose durative reading seems intuitively just as basic and uncoerced as the punctual one. The former case, the one of genuine iterativity is one that I would argue should be represented by an aspectual head outside the first phase proper. I am more uncertain about what should be done about S-summing in the Rothstein 2004 sense.

Pending further investigation, I tentatively assume that the special status of semelfactives is something noted in its lexical entry, and that they are the only verbs we have seen so far which are ambiguous between being [*init, proc, res*] and [*init, proc*]. On the former possibility, the verb so built will have to be punctual, and the lexical encyclopedic content of *jump* will have to describe the nature of the transition. On the latter case, the lexical encyclopedic content of *jump* purely describes a process— the facts we know about jumping activity. The idea here is that Kamp/Rothstein intuition about the special conditions on S-summing are essentially correct, but that they are not conditions on the applicability of an operator in the syntax, but diagnostic conditions for a lexical item that could be ambiguous between being a process verb and a process-result verb.

Thus, when a verb like *jump* is used in its activity reading, it is compatible with Path PPs just like other motion verbs (36a) and not with locative Place PPs (36b), The activity reading of 36a) is represented in (37).

(36) (a) Katherine jumped into the field. (with directed motion: activity reading possible)
(b) Katherine jumped in the field (with directed motion: only punctual reading possible)

---

[7]Although it is not clear whether Rothstein herself would sanction such a move.

(37)

```
                        initP
              ╱         ╲
      Katherine          ╲
                    ╱        ╲
                init          procP
                jump       ╱      ╲
                     ╱              ╲
              < Katherine >          ╲
                              ╱        ╲
                          proc          PP
                           |          ╱    ╲
                       < jump >into the field
```
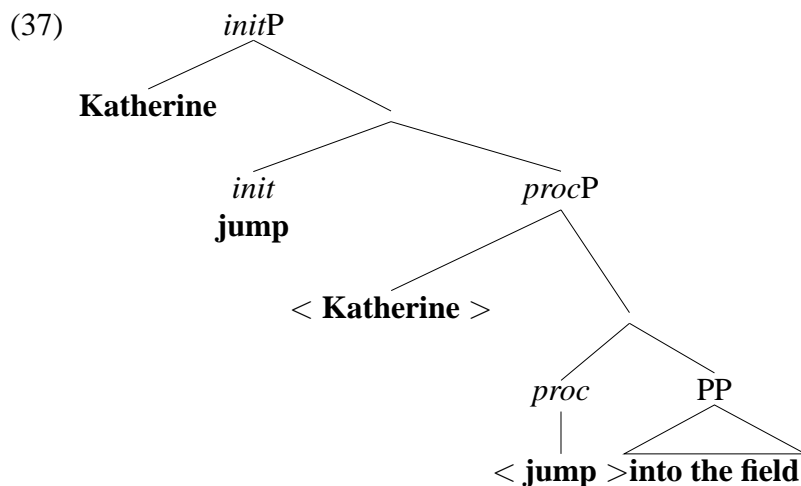
4.3   Transitivity Alternations

So far, I have not considered verbs which do not contain an [init] feature at all. in other words, the intransitives I have considered have been those that arise because of composite roles, not because of the lack of initiational predicational structure. Although there have been various different definitions of 'unaccusativity' in the literature, I will call the verb class which lacks an initiational functional head in the eventive decomposition the 'unaccusative' type.[8] Does this latter type exist, and how do we distinguish them from other intransitives? Also, what distinguishes the classes of alternating verbs from those which do not alternate?

The longstanding debate concerning the causative/inchoative alternation has centred around whether the transitive variant should be derived from the intransitive by causativization (Davis 2000), or whether the intransitive should be derived from the transitive by means of some kind of argument identification or suppression (Reinhart 1996,Reinhart 2002, Chierchia 2004). The choice hinges on many

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[8]The general intuition behind unaccusativity is that the single argument of the verb shares crucial properties of 'objects' of transitives. Because roles are composite in this system, this could be captured by the fact that verbs like *run* have a single argument that is both INITIATOR *and* UNDERGOER (i.e. sharing something with transitive subjects which can be pure INITIATORS), while others might be pure UNDERGOERS if the initiational subcomponent is missing. The correlation of unaccusativity with telicity that has been claimed in the literature, is not systematic under this system, correctly so, I believe, since there are unaccusatives such as Hay, Kennedy, and Levin 1999's degree achievements which are not obligatorily telic despite conforming to unaccusative diagnostics in many languages.

factors, including the simplicity of the resulting system, the direction of morphological complexity, and the predictions from semantic selectional restrictions. In fact, it seems both possibilities are attested in different languages.

In the present system, there is no mechanism of argument identification per se, but its equivalent can be found in the creation of composite roles instead of filling each specifier position with a distinct DP. So far, there is no equivalent of argument suppression, but a logically possible analogue would be the non-projection of category features of the root. In either case, it would be important to constrain these mechanisms if they are to be part of the system and deployed to create intransitive alternants from transitives.

Looking first from the perspective of 'detransitivization', considering the verbs analysed as belonging to the [init, proc] and [init, proc, res] classes, we can see that there are transitives in both classes that have intransitive variants, side by side with transitives that do not. So for example, in (38), we see an [init, proc] transitive that has an inchoative version, while in (39) we see an [init, proc] transitive that does not.

(38) (a) Karena melted the butter.
     (b) The butter melted.

(39) (a) Karena hammered the metal.
     (b)*The metal hammered.

Similarly, in the [init, proc, res] class of transitives, some verbs such as *break* have an intransitive alternant (40), but others such as *enter* or *throw* do not (41).

(40) (a) Alex broke the stick.
     (b) The stick broke.

(41) (a) Ariel threw the ball.
     (b) *The ball threw.

One question is whether these alternations, when they occur, represent a conflation of INITIATOR and UNDERGOER roles (something allowed in this system and exploited for motion intransitives such as *run* and *dance*), or whether the initiation component is entirely missing, pointing to a kind of suppression. However, either way, some diacritic in addition to the feature composition of the lexical entry, would be necessary to register whether detransitivization is possible in any particular case. This is especially so, if, as I have argued, *break* vs. *throw* and

melt vs *hammer* cannot be distinguished by their category features or the aktion-sart properties that derive from them.

If we look at the alternation as being causativization as opposed to detransitivization, a potentially simpler system emerges. The intransitives that I have argued to contain an initiation component in the previous sections, i.e. those arising from role composition, are precisely the ones that do not causativize (42).

(42) (a) *Michael ran Karena.
      (b) *Kayleigh arrived Katherine.

If we now assume causativization to be a general process in English, as a result of automatic structure-building, and allowed because of the presence of a dafault null *init* head, then the verbs that causativize will have to be those which do not contain [init] in their lexical specification. Thus, contrary to what I assumed earlier for the simplicity of exposition, the transitive version of *melt*, and indeed *break*, should always contain a null *init* head with the semantics of general causation.

(43)

$$
\begin{array}{c}
\textit{init}\text{P} \\
\diagup\diagdown \\
\textbf{Karena} \\
\end{array}
$$
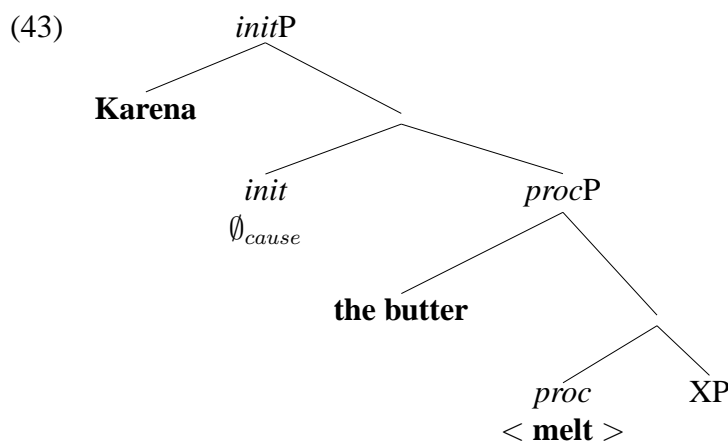
In the intransitive version, *melt* would occur on its own, allowing just [proc] to be identified.

(44)
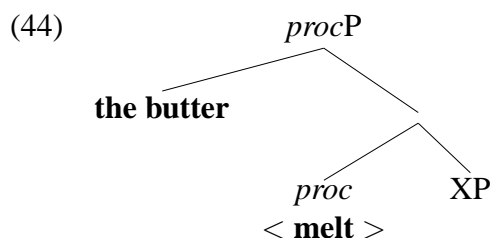
Transitive vs. intransitive 'break' would be treated the same way: the intransitive version has *break* identifying [proc, res]; the transitive version builds on this lexical item, using in addition, the null lexical item *init$_{cause}$*. Under this analysis, the representation for 'Katherine broke the stick' would not be as assumed in the previous sections, but instead involves transitive *break* being morphologically complex, containing a null causative suffix in the *init* head position (45).

(45) Katherine broke the stick.

```
                    initP
                   /    \
           Katherine     \
                        /   \
                     init    procP
                      ∅      /    \
                     the stick     \
                               /        \
                            proc        resP
                           break       /    \
                                  the stick   \
                                           /      \
                                         res       XP
                                      < break >
```
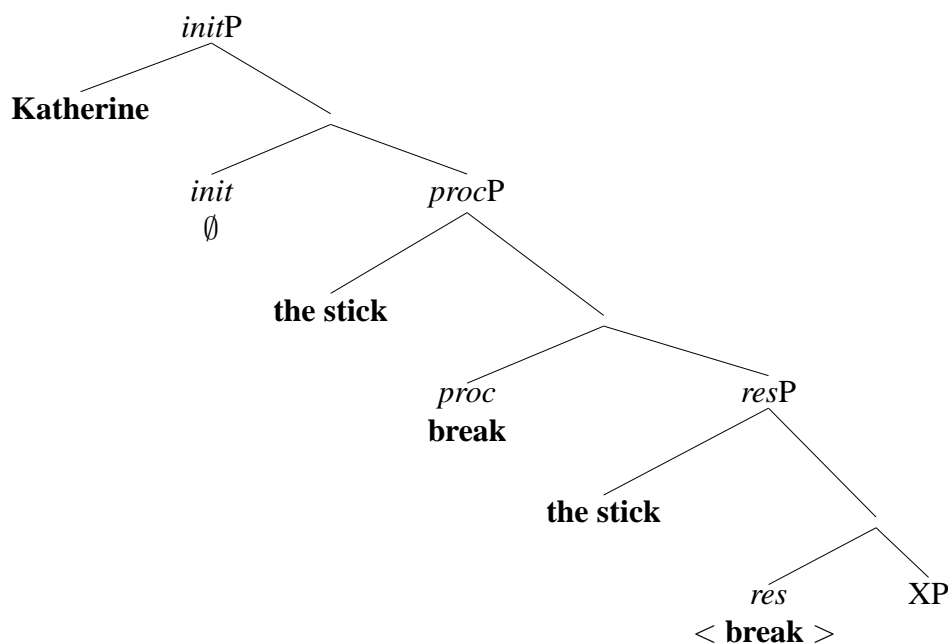
The advantage of the causativizing approach to the alternation is that no additional mechanism or diacritic is necessary to isolate the relevant alternating class other than the listing of category features already assumed by the system. Very simply, the verbs which alternate are those which do *not* contain an [init] feature in their lexical entry; the transitive version is always available because of the presence of a null lexical item (the causative 'suffix') in English. Many languages do indeed possess explicit causative suffixes on roots (see chapter 6 for further discussion) which mediate transitivity alternations. The disadvantage of this analysis is that it forces the postulation of a null causative head, although because of the robustness of the alternation in English, it's existence would plausibly be very salient to the learner.

The alternative to the null causative head would be to claim that some verbs like transitive *break* or transitive *melt* are listed as [(init), proc, res] and [(init),

proc] respectively, with an optional initiation portion, while verbs like *throw* are [init, proc, res] and do not offer such optionality. As far as possible, I wish to pursue an approach whereby this kind of optionality is extremely restricted, to certain semantically well-understood subcases, as in the semelfactive verbs discussed in the previous section. The system also does not allow any 'reduction rules' in the lexicon—- these are simply not statable under current assumptions. On the other hand, given a constructionist approach, alternations based on legitimate structure building are the most natural ones to state. In the particular case of English, causativization by means of structure building in this system is a logically possible option. Moreover, allowing it via a null *init* head would make for a simpler set of mechanisms for capturing the distributional restrictions on the process.

Since English does not provide us with any overt morphological indicator of derivational complexity, the other factor to consider would be whether any evidence can be gleaned from semantic selectional restrictions. In fact, as has been pointed out in the literature (Hale and Keyser 2002), the selectional restrictions on the subject position of alternating transitive verbs are far less stringent than on the nonalternating verbs. Thus, in English, transitive *break* and *melt* seem to admit a wider range of general causes in subject position (46) than nonalternating verbs like *throw* (47) or *pound*.

(46) (a) The cold broke the glass.
      (b) The storm broke the glass.
      (c) Kayleigh's clumsiness broke the glass.
      (d) Michael broke the glass.
      (e) The sun melted the butter.
      (f) Inflation increased the store prices.
      (g) Age yellowed the pages of the book.

(47) (a) ??The wind threw the towel over the fence.
      (b) *Katherine's inattention threw the towel over the fence.
      (c) Michael threw the towel over the fence.
      (d) ??The traffic pounded the pavements.
      (e) ??The storm smeared mud on the walls.

Under the null causative head analysis, this is understandable: the nonalternating verbs are lexical entries that identify *init* and will impose specific lexical encyclopaedic requirements on their INITIATORS; the alternating verbs have a

null cause head identifying *init* in their transitive versions and the requirements are more abstract, constrained only by general causational semantics.

For these reasons, I will assume a causational analysis of alternating verbs, via a null lexical cause head in English.[9]

One other point that should be addressed at this point is the systematic difference between 'unaccusative' alternants of such verbs and productive processes like passive which also create non INITIATOR predications. The general wisdom concerning passive is that, while the 'agent' is absent, it is somehow still semantically present and can control purpose clauses, and license certain agentive adverbial phrases not possible with real unaccusative verbs (compare (48) and (49)).

(48) (a) The ball was thrown to annoy Alex.
      (b) The ball was thrown by Kayleigh.
      (c) The ball was thrown deliberately.

(49) (a) *The stick broke to annoy Alex.
      (b) *The stick broke by Kayleigh.
      (c) *The stick broke deliberately.

I assume that with passive, the transitive verbs still retains and projects its [init] feature, although the passive morphology existentially binds off the actual INITIATOR position.[10] Many recent accounts have proposed that passive is a particular 'flavour' of the little *v* head, analogous to my *init*. Under the system being explored in this monograph, that analysis cannot be correct, because it would leave mysterious why passives of unaccusatives are impossible. Rather, passive is composed of a number of different mechanisms, perhaps the most crucial of which is the binding off of an argument in INITIATOR position, and does not apply when *init* is not projected and identified. This is different from the analysis offered here for unaccusatives, where no *init* head is present.

4.3.1   Degree Achievements

Before leaving the issue of alternating verbs, I wish to address, briefly, the issue of degree achievement verbs, whose aspectual properties have been subject to much

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[9]I will take up cases of causativization in more detail in chapter 6, where I will examine a language with explicit causative morphology.

[10]I leave it open at this point whether this is done by a functional head embedding *init*P, or via some actor null pronominal in the INITIATOR position. See Ramchand and Svenonius 2004 for a discussion and a proposal.

recent interesting work (Hay, Kennedy, and Levin 1999, Rothstein 2004). I can scarcely do justice to the complexity and subtlety of the semantic data within this class of verbs in the context of this short monograph (as indeed with so many of these verb types), but the system laid out here comes along with a particular analysis for these verbs. Recall that degree achievements are classically (i) alternating in transitivity and (ii) ambiguous between a telic and atelic reading (iii) are often 'deadjectival'. I follow Hay, Kennedy, and Levin 1999 in analysing these verbs are a special kind of process verb where the degree of verbal change is mapped onto a property scale of some sort (derived from a basic adjectival meaning). Thus, in their intransitive use, they are classic *proc* verbs, with the single argument being an UNDERGOER.

(50) (a) Waiting times at the NHS lengthened steadily for 5 years.
      (b) The cocoa beans dried in the sun for two hours.

(51)
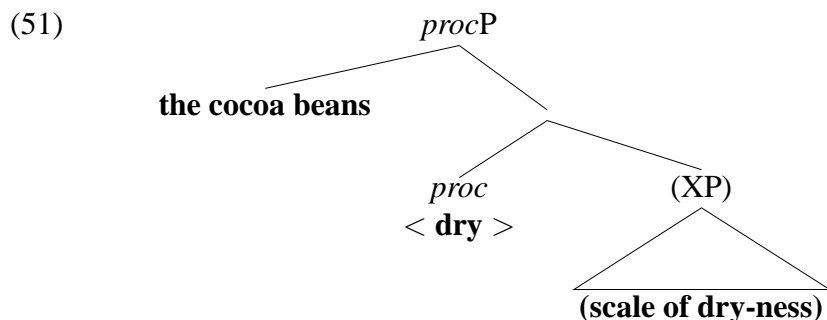
I further follow Hay, Kennedy, and Levin 1999 in assuming that the fact that these verbs can also be interpreted telically does *not* arise from them identifying a *res* subevent, but is a contextual effect. Recall that in the case of motion verbs (also [*proc*] verbs), a telic reading could be obtained if the XP in complement position to *proc* denoted a bounded path. In the case of degree achievement verbs, the complement position is filled implicitly by the property scale denoted by the corresponding adjective. If that property scale is contextually bounded then the verb will be telic.

(52) (a) The tailor lengthened the trousers in just twenty minutes.
      (b) My hair dried in just ten minutes in that weather.

Note that this behaviour is predicted by the the homomorphic unity proposal for rhematic complements, if we assume that the complement of the degree achievement is actually an implicit property scale. In addition, in this system, if the degree achievement verb were to (optionally) also identify *res*, then on that reading

it would have to be punctual. I am not sure that such cases exist: there are certainly examples where the change is consistent with quite a rapid transition, but they do not seem to my ear to require it.

(53) (a) The gap widened (suddenly).
      (b) John froze (in his tracks).

If such cases can be argued for, then we would have another subclass of verbs that was ambiguous between being [*proc*] purely and [*proc*, *res*]. It is relevant in this regard to point out that Rothstein 2004 actually explicitly makes a connection between semelfactives and degree achievements with respect to S-summing. She argues that degree achievements are of the right type to undergo S-summing because an indefinite change along a property scale can always be the starting point of another indefinite change along the same property scale, and thus the atomic changes of state denoted by the degree achievement can be S-summed seamlessly to form a derived process. I concede that there is something interesting in common with these two classes of verbs, but my intuition is that there is an important difference: while the activity reading of semelfactives can be *derived* from the punctual by s-summing, with the degree achievements it is not clear to me that the telic reading found in cases such as (52) above really is an atomic subpart of the readings in (50). For this kind of alternation, then, I reject an account that unifies it with the semelfactive alternation. On the other hand, if genuinely punctual readings of degree achievements (as perhaps in (53)?) exist as opposed to being simply vague, then the Rothsteinian account should be implemented and an additional option for degree achievements countenanced in which they also identify *res*.

Degree achievements nearly always have transitive versions. I assume that this is true simply because they are [*proc*] verbs, and are thus input to the structure building processes that would create derived causatives as in the general case discussed in this section.

4.4   Conflation Verbs

In the lexical decompositional system of Hale and Keyser 1993 and subsequent work, a good deal of emphasis is place on 'conflation' type verbs (denominal and deadjectival verbs) where it is claimed that the verb is derived by abstract incorporation into the head of the verbal projection from complement position, subject to principles of syntactic movement.

Under the system I am proposing here, the complement position of a verbal head is filled by RHEMES (either RHEMES of process, or RHEMES of result). An example of a syntactic structure showing the rhematicPATH object ' a mile' is given in (54) below.

(54)

```
        initP
       /    \
     'x'      \
             /  \
          init    procP
           |      /   \
          run   'x'     \
                       /   \
                    proc    DP
                     |      /\
                  <run>   a mile
```
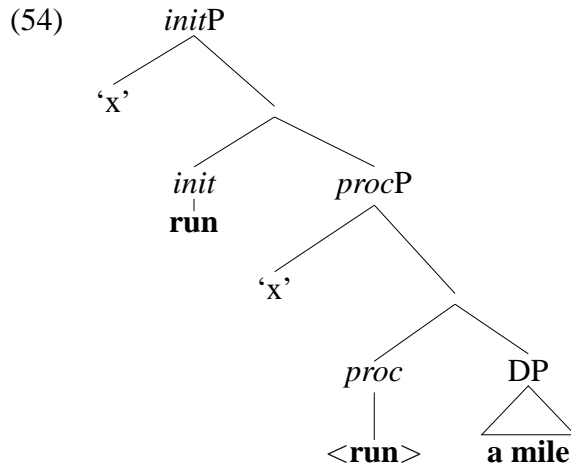
Conflation verbs seem to arise from rhematic material being incorporated from complement position into the head. So, in the case of the verb *dance* below, the nominal 'dance' can be thought of the RHEME of the generalized *do* process.

(55)

```
        initP
       /    \
     'x'      \
             /  \
          init    procP
                  /   \
                'x'     \
                       /   \
                    proc    DP
                     |      /\
                    do    dance
```
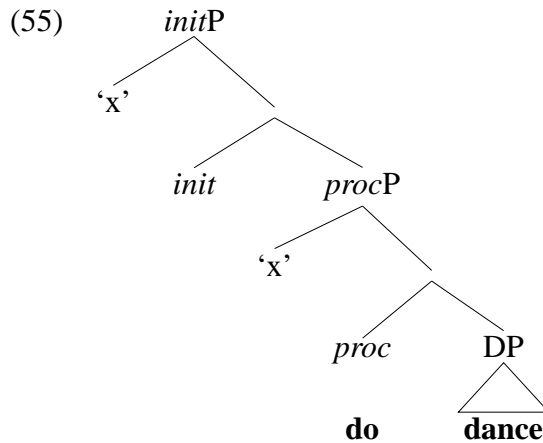
In the case of the location verbs, the nominal in question is the complement of the PP that is the RHEME of result, further describing the result state achieved by the undergoer of translational motion. In the case of locatum verbs, the RHEME of result is the possessional PP 'with saddle'. So once again, the nominal 'saddle'

is within the rhematic material of the clause, and incorporating it would be an (unproblematic) case of incorporation from a complement position.

(56)

```
        initP
       /    \
     'x'     \
            /  \
         init   procP
               /    \
             'y'      \
                    /    \
                 proc    resP
                        /    \
                      'y'      \
                             /    \
                           res    PP
                                 /   \
                               'y'    P̄
                                     /  \
                                    P    DP
                                    △
                                   on    shelf/
                                  with   saddle
```
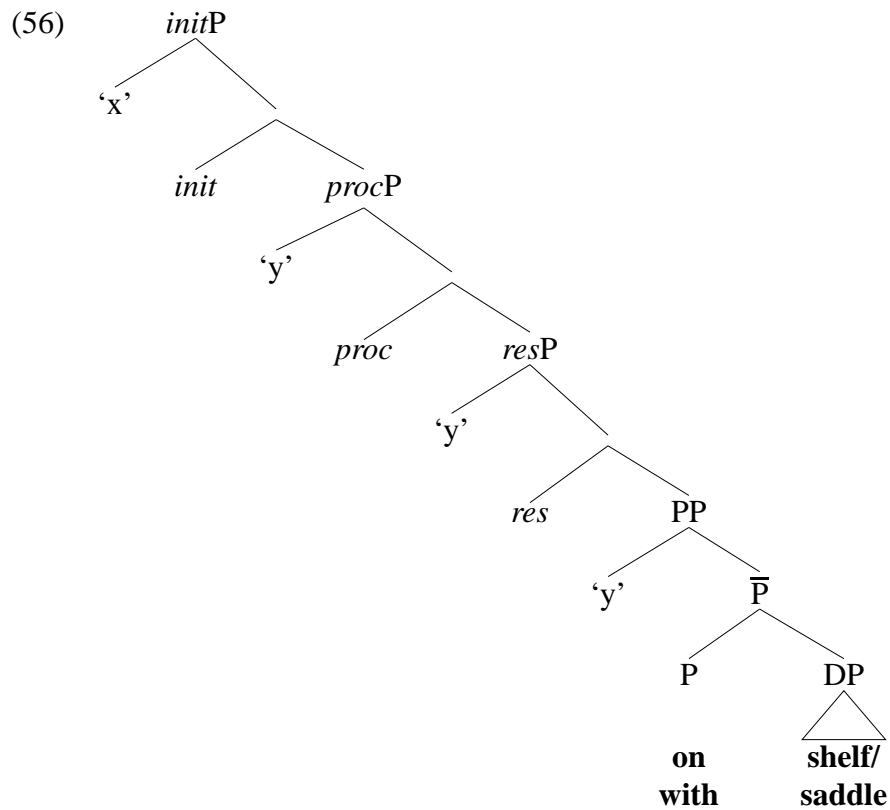
In the case of deadjectival verbs, once again the incorporation seems to be from the AP rhematic complement of the *Res* head.

(57)

```
     initP
    /    \
  'x'     \
         /  \
      init   procP
            /    \
          'y'      \
                 /    \
              proc    AP
                      △
                     clean
```
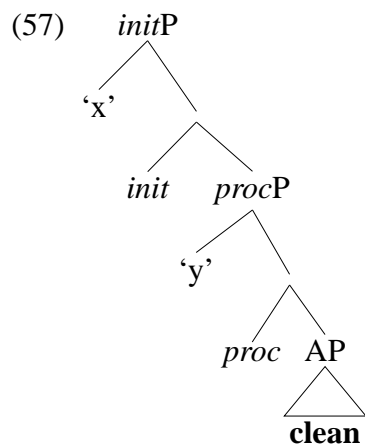
I agree with Hale and Keyser 1993 that the verbal types we find in natural language reflect patterns and generalisations that are at heart syntactic. The point about all of these conflation type verbs is that there is a particular syntactic configuration from which 'incorporation' is systematically possible. I differ from Hale and Keyser in that I have a more articulated decomposition than they do, and in particular, I make a distinction between RHEMES of process (which further describe the process by expressing manner or path) and RHEMES of result (which further describe the final state or location). Thus the crucial distinction is not between deadjectivals and denominals, or between location verbs and manner verbs, but between conflation into the *Res* head vs. conflation into the *Proc* head.

But in addition, there are notorious problems with seeing 'conflation' as a literal syntactic incorporation process, as Hale and Keyser 2000 themselves point out. The central difficulty is that the complement position of a so-called conflation verb can indeed by filled by an overt DP— a surprising fact if that position bears the trace of the incorporee.

(58) (a) Kayleigh danced a jig.
    (b) Karena shelved the books on the mantlepiece.
    (c) Michael saddled the horse with an old second hand saddle he borrowed from James.

For this reason, I reject a syntactic incorporation analysis of these verbs, and indeed a syntactic derivational account of the alternations in English that give us *dance$_N$* vs. *dance$_V$* and *shelf$_N$* vs *shelve$_V$*. On the other hand, the generalization relating rhematic content to recognizable morphological properties of the verb seems too strong to simply ignore and demands some kind of explanation.

Consider again the kind of decomposition I have been assuming for predicational structures: embedded situational descriptors with a predicational asymmetry between specifier ('theme') and complement ('rheme'). This structure is recursive, but not in practice infinite. At some point, the structures must 'bottom out' and contain a non-branching, missing, or implicit rhematic position. With verbs this is possible when the lexical encyclopaedic content is in principle rich enough to identify the nature of the subevent without any explicit complement material. One way of thinking of this is to see the rhematic material as being implicit. Thus, another possibility for analysing 'conflation' verbs is to see them as having implicit RHEMES, licensed by the lexical encyclopaedic content of the root.

(59)

*init*P

'x'

   init   *proc*P
   dance

     'x'

       proc   DP

      < **dance** >**(some kind of dance)**
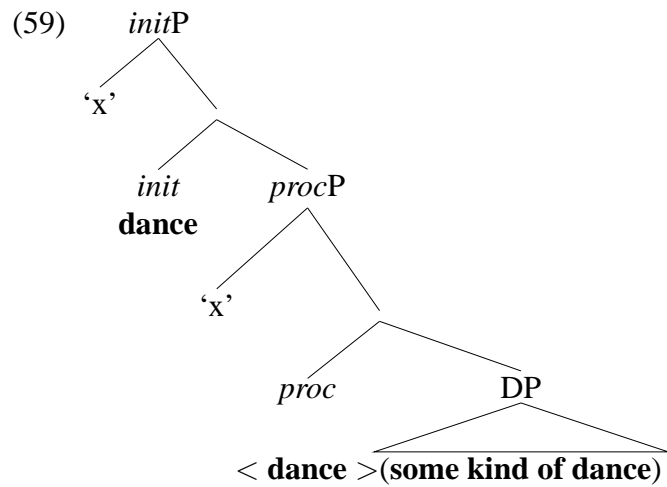
While the rhematic material is not necessary, of course the complement of process can indeed be filled with a more specific spelling out of that content. Similarly, the verb *shelve* is just a [init, proc, res] verb with an implicit rheme.

(60)

*init*P

'x'

   init   *proc*P
   shelve

     'y'

       proc   *res*P
      < **shelve** >

         'y'

           res   PP
           < **shelve** >

              (on something that acts as a shelf)
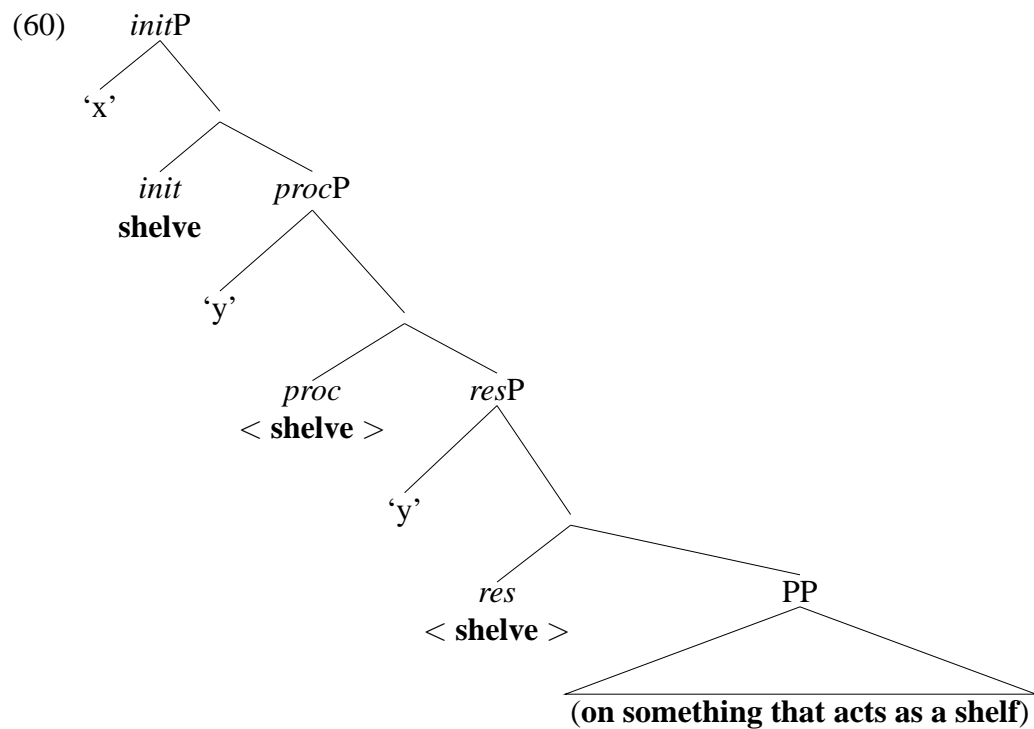
The similarity is an accident, but not entirely so. Derivationally related lexical items share the same lexical encyclopaedic content so it is not surprising that it

looks like we can spell out the rhematic content of such a verb with a similar lexical item.

The phenomenon of 'conflation' verbs illustrates graphically the fact that there is a close semantic relationship between eventive heads and their complements: together they form the predicate that is predicated over the 'subject' of that event in specifier position. A richly specified verb with an implicit rheme is equivalent to a light verb with a more articulated complement. While previous analyses have accounted for this relationship by means of syntactic incorporation, there are serious problems with making this process congruent with what we independently know about syntactic processes. In English, the temptation to an incorporating analysis is all the stronger because of the lack of overt morphological indicators of syntactic category membership. Nouns and verbs share morphological shape in many instances, and share a core of encylopaedically associated information. This makes verb X_V look in many cases as if it is equivalent to some abstract 'light' verb with the nominal element X_N as its complement. However, in this section I have proposed that in fact this is just due to the fact that both entries X share a large amount of lexically associated encyclopaedic content. The claim therefore is that 'conflation' verbs are simply those verbs with implicit rhemes, due to the nature of the lexical content they bring with them.

4.5   Double Object Verbs

I turn now to the puzzling conundrum that is the dative alternation. Verbs that have a 'double object' version are interesting for a number of reasons. First of all, we need to answer the question of why two 'objects' are possible at all in these restricted circumstances (given the Case restrictions that seem to prohibit those structures more generally). Secondly, we need to account for the alternation in argument structure properties between the two variants, and establish whether a derivational account or a base generation account is more plausible. The variability issue is particularly pressing, given the productivity of the alternation, even with nonce verbs.

 (61) (a) Alex blerged the ball to Ariel.
        (b) Alex blerged Ariel the ball.

There is no space here to do justice to the extensive literature on the double object construction (Oehrle 1976, Larson 1988, Pesetsky 1995. Hale and Keyser
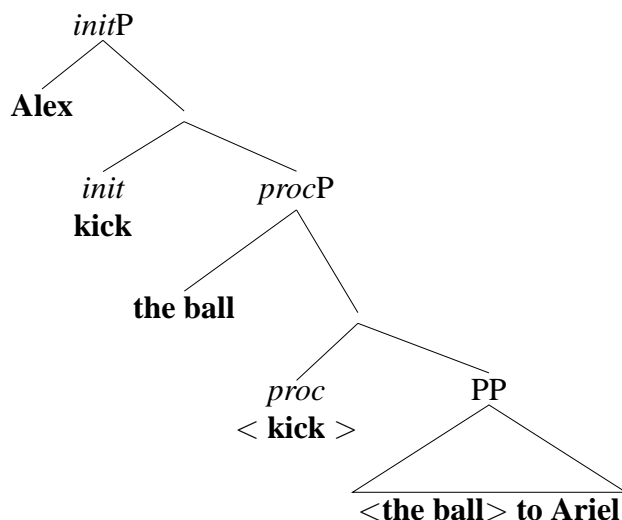
1996, Harley 2000, Anagnostopoulou 2003, to name but a few). Concentrating, then, on what the current approach would say about these constructions, a derivational analysis goes directly against the spirit of the system being proposed in this paper. The constructionalist view I am espousing allows no level of representation where argument structure could be specified as attached to a particular lexical item. Therefore, neither syntactic instantiation can be the 'primary' one, with the other one being 'derived' , either in the lexicon or the syntax. Derivational processes in the lexicon do not exist by hypothesis under this system, and even a syntactic derivational account would be incoherent since it would presume that there is some specified argument structure information projected by the lexical item as the 'primary' meaning. Nor would it be coherent to have multiple lexical entries with 'different' argument structures. The view of first phase syntax and lexical attachment proposed here, would have to say simply that there is more than one syntactic structure that is consistent with the lexical encyclopaedic content of the verbs in question. In this sense, I will be proposing a base generation account, much along the lines of Pesetsky 1995 and Harley 2000.

Consider first the PP version of the alternation, using the verb *kick*.

(62) Alex kicked the ball to Ariel

The verb *kick* here clearly has a initiating subevent that licenses an INITIATOR, and it also identifies a process subevent that describes projectile motion on the part of the UNDERGOER. In addition, there is a PP path which describes the trajectory covered by the UNDERGOER, which in this particular case is a bounded path characterised by having 'Ariel' as its final point. Given this interpretation, the properties of the verbal decomposition hypothesized here predicts only one representation.

(63) Alex kick the ball to Ariel.

```
                      initP
                     /    \
                  Alex     \
                          /  \
                       init    procP
                       kick    /   \
                            the ball \
                                   /    \
                                proc      PP
                              < kick >   /  \
                                        /     \
                                  <the ball> to Ariel
```

Consider now the double object alternant.

(64) Alex kicked Ariel the ball.

In this case the verb once again identifies the initiation and process in question, with INITIATOR being 'Alex'. There is no preposition in this structure, but there is a predicational relationship between 'Ariel' and 'the ball'. I assume that it must be the presence of a 'small clause' of some type that licenses the extra predicational position and the extra entailments over that position. Here, the semantics seem to be that of general/abstract possession: 'Ariel' comes to physically or notionally possess 'the ball', moreover, this seems to be a genuine 'result'. This analysis is identical in spirit with the ones proposed in Pesetsky 1995 and Harley 2000. The predicational head is necessary (i) to assign structural case to the RHEME of possession, here 'the ball'; (ii) to license the external thematic relation of RESULTEE to 'Ariel'.

(65) Alex kicked Ariel the ball

```
                    initP
                   /    \
              Alex       \
                        /  \
                   init  procP
                   kick  /   \
                        /     \
                       /       \
                   proc        resP
                  <kick>      /    \
                         Ariel      \
                              /      \
                           res       DP
                          ∅_poss     /\
                                    /  \
                                 the ball
```
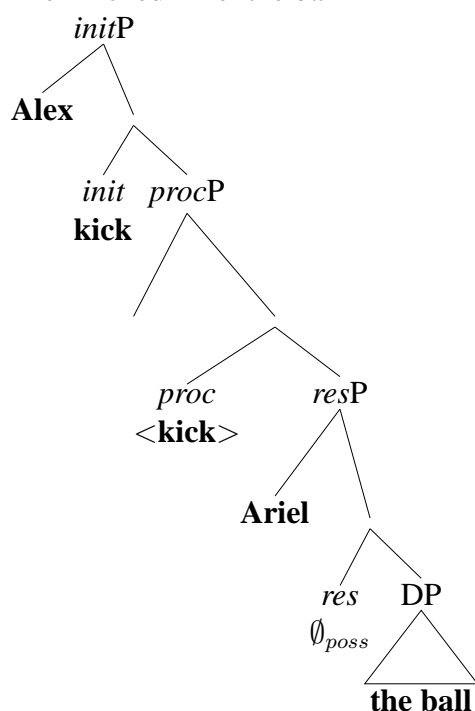
While the lexical encyclopedic contribution of the motion verb *kick* here remains the same for both versions, the analysis hinges on the availability in English of a null *res* head with abstract possessional semantics. This is a good thing, since the double object alternation is not found in all natural languages. The productivity of the alternation in English can be reduced to the availability of this particular lexical item. In fact, I will argue that this very same lexical item is implicated in the building of adjectival resultatives with unselected objects (see chapter 5). Significantly, a language like Italian which does not allow the double object construction, also does not have simple adjectival resultatives (see Folli and Ramchand 2005). This suggests that associating adjectival resultatives with the double object construct via the existence of a particular lexical item is on the right track.

Thus, the two alternants are not exactly parallel, either semantically or syntactically. Here we get confirmation from the literature which cites many cases in which the semantics of the two alternants is slightly different, and where the difference can be shown to be precisely what we would predict given the two slightly different small clause predications involved.

In the case of the examples in (66), the abstract possessional *Res* head is suitable for the relation between a person and the thought or idea he has in his head,

but the *to* preposition with its meaning of (physical or abstract) transfer is very odd. The 'idea for a book' does not first reside in some abstract location close to 'the interview with Nixon' and then become transferred to Mailer's mind. The possessional *Res* is consistent with abstract location, whereas *to* definitely requires abstract 'transfer' since it is a PP representing a 'path' complement of the *proc* head. (Levin and Rappaport-Hovav 2001)

(66) (a) The interview with Nixon gave Mailer the idea for a book.
     (b) ??The interview with Nixon gave the idea for a book to Mailer.

Similarly, given the dynamic nature of abstract 'transfer' with a PathP complement of *proc*, we expect to find cases of stative double object constructions, where the *to* version is systematically impossible. Here the thing that is the ground for 'Alex's' envy is the state of affairs of 'Ariel' possessing 'the new bike', no transfer of location, either physical or abstract is involved.

(67) (a) Alex envied Ariel the new bike.
     (b) *Alex envied the new bike to Ariel.

It is more difficult to find incompatibilities in the other direction, since abstract location can always be seen to be a sub-property of abstract transfer. There *are* such cases though, and interestingly they seem to be the cases where the verb is latinate and morphologically complex and already contains 'prepositional' content.

(68) (a) Karena donated the clothes to charity.
     (b) *Karena donated the charity the money.

In these cases I would argue that the verb *donate* itself obligatorily identifies the *Res* head, and is not compatible with $\emptyset_{poss}$. The crucial thing about the null lexical item in the double object construction, then, is that it is a *Res* head, and must be used as such. In the (a) version of the 'donate' sentence above, the 'to-PP' is the complement of the *Res* head already identified by *donate*.

One other important difference between the *res*P structure and the dative alternant is that while 'Ariel' is the RESULTEE, it is not at all clear that the semantics are consistent with 'Ariel' being the UNDERGOER. [11] It is well known that there

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[11]For case reasons, the expression of a distinct UNDERGOER is impossible, so it must remain implicit. If there is a notional UNDERGOER, it would have to be 'the ball' itself although that particular relation is not, I assume, represented directly in the double object structure.

are differences in the behaviour of the two 'objects' in the double object construction, and also that there is a difference between the direct object in the dative version and the 'first' object of the double object version. This difference would be surprising under an account where the only thing that varied was the predicational content of the 'small clause' complement to the verb. Under the story I am suggesting here, the 'first' object of the double object version is not related predicationally to any subevent that is actually identified by the verbal root. I take this to be the reason that such objects cannot be one of the interpretations of a possessor in a derived nominal version of this verb. (REFS)

(69) (a) The mayor's gift of the medals
    (b) The medals' gift to the soldiers.
    (c) *The soldiers' gift of the medals. (where soldiers are the recipients).

There are other differences between the direct object in the double object version of these verbs and their PP alternants. It has been claimed that there are asymmetries in the interpretation of depictives and in with respect to scope (Basilico 1998). I leave a detailed treatment of these facts to further research, pointing out only that the two different structures are significantly different from each other and that the dative object in the double object version is in a separate predicational structure from that identified by the root. I speculate that these differences are at the source of the scope freezing and modifiability facts noted in the literature. Another asymmetry between true UNDERGOER objects and the RESULTEE objects of double object verbs is that secondary depictives can always go with the former, but not the latter. Even in the double object construction, the non-recipient argument, which isn't even the syntactic (passivizable) direct object can support depictives (70). (REFS)

(70) (a) Karena gave the baby the bottle full.
    (b) Karena gave the bottle to the baby full.
    (c) Karena gave the baby the bottle crying.
    (d) Karena gave the bottle to the baby crying.

Once again, these facts can be made to fall out of the structures I am assuming here. I assume that depictives attach either to *initP* as adjuncts, or to *procP*. In the former case, they modify the INITIATOR argument, but in the latter, they target the UNDERGOER argument. This explains the interpretational possibilities of (b), (c) and (d): in (b) either 'Karena' or 'the bottle' can be full; in (c) only 'Karena'

can be 'crying'; in (d) either 'Karena' or 'the bottle' can be 'crying' although the latter is discounted for real world knowledge reasons. The only mystery is the fact that (a) allows an interpretation whereby the bottle is full, even though under this story, 'the bottle' is in the rhematic position of the result possessional head. However, since I have assumed that there is an implicit UNDERGOER here, whose content is identified by 'the bottle'. I thus assume that the *procP* adjunct position is controlled by the implicit UNDERGOER (since we know already that 'control' by implicit arguments is possible). Control is therefore not by the element in the complement of *Res* directly, although it indirectly gets its reference from it.

Given the possibilities of verbal decomposition, and crucially, the existence in English of the null head *Res* head, we would predict that any dynamic predicate should be augmentable with a DP, provided its encyclopaedic semantics are compatible with a final abstract 'location'. This predicts that any verb of directed motion will participate in the alternation. The difference in syntactic representation hinges on whether a *res*P is built using the English null *res* head, and which will therefore require a DP RESULTEE (or 'Figure') of the result state, and a DP RHEME (or 'Ground'). If no such *res*P is built, i the UNDERGOER itself is to be the FIGURE of the process which is homomorphically unified with the path PP complement.

4.5.1   Applicatives More Generally

Applicatives have been the subject of much recent work on argument structure changing operations (Baker 1988, Baker 1996, Pylkkänen 1999) and are an important locus of crosslinguistic variation. There seems to be some consensus that there are at least two types of applicatives in language— the 'inner' ones which are more lexically restricted, and which crucially rely on an internal predicational relationship with the initial direct object; 'outer' ones which are more productive and which create a relationship between the applied argument and the whole event (see Pylkkänen 1999). Pylkkänen argues that the inner applicatives involve a special inner applicative head that occurs between the verbal categorial head and the root, while the outer ones involve a head that occurs between little *v* and the root. The inner applicative heads in this sense are the ones that I believe are part of the verbal decomposition being proposed in this book, and the possessional result head that I am assuming for the English double object construction is one lexical instantiation of what Pylkkänen calls the lower applicative head. It is this head, which mediates a predicational relationship between the original direct object and an applied argument, which is equivalent to the res_{poss} I have been assuming.

While possessional lexical heads are common crosslinguistically, I assume others to be in principle possible with possibly different, or more abstract lexical content, depending on the lexical inventories of the languages in question. High applicative heads however, I assume are outside the remit of the core verbal decomposition and relate more directly to the event as a whole. I assume that such heads, when allowed, introduce predicational relationships between an applied argument and the whole constructed *init*P. This is somewhat at odds with Pylkkänen's technical assumptions since she places the higher applicative head lower than little *v* (presumably the closest analogue to my *init*). However, the reasons for placing it there as opposed to outside the little *v*P altogether are not to my mind overwhelming: the semantic facts dictate that the complement of the higher applicative head be the event denoting projection and the only reason it is placed lower in Pylkkänen's account is to allow the highest argument to be eventually attracted to the clausal subject position. If we assume that the 'applied' argument gets its own form of prepositional case and in invisible for attraction to the Spec, TP position to become the subject, then it can be generated outside of *init*P without sacrificing the subject properties of the clause.

This brief discussion scarcely does justice to the vast literature on double objects and applicatives crosslinguistically. As in practically every other topic treated in this chapter, I leave a detailed investigation and analysis to later work, but indicate merely how the research programme being defended in this book would apply to various important empirical domains in the literature.

4.6 Statives

Stative verbs are different in an important way from the other verb types considered so far in this chapter, most importantly in not containing a *proc* projection, the hallmark of dynamicity. I assume that stative verbs arise when an *init* head selects rhematic material instead of a 'process' complement. The rhematic material in question can be either a DP as in (71a), an AP (71b) or a PP (71c). It is also possible for *init* to be filled with the encyclopaedically impoverished verb *be*, in which case the existence of rhematic material is almost forced in order to fully describe the state (72).

(71) (a) Katherine fears nightmares.
    (b) Ariel looks tired.
    (c) The two rivers meet at the end of the field.

(72) (a) Katherine is in bed.
       (b) Alex is happy.
       (c) ?Ariel IS.

(73) **State**: *x fears y*
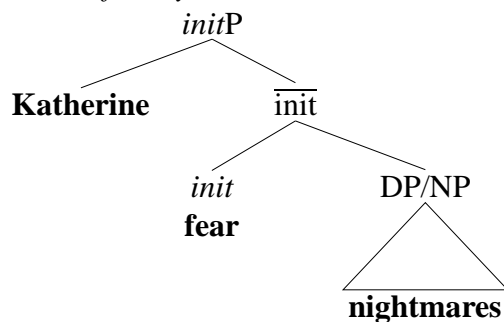
I am assuming that it is the *init* head that is at issue here because it shares some salient properties with the *init* head in dynamic predications. First of all, the DP argument in its specifier is the entity whose properties are the cause or grounds for the stative eventuality to obtain, for example, it is because of Katherine's personality that the state of her fearing nightmares arises. Secondly, stative verbs are able to assign accusative case to their objects, a characteristic we have been assuming applies to the *init* head generally in dynamic predications as well.

4.7   Summary

Although there are potentially many issues left to discuss, I close this section with the idea that the many different types of verbs and verb classes can be put together with a relatively impoverished set of primitives, and that the different possibilities for verbal event structure meanings/behaviours can be predicted by syntactic form, and some general principles of lexical association.

The internal eventive/causational structure of a verbal predication maximally decomposes in this system as follows.

(74)

*init*P (causing projection)

DP$_3$
subj of 'cause'

init

*proc*P (process projection)

DP$_2$
subj of 'process'

proc

*res*P (result proj)

DP$_1$
subj of 'result'

res   XP
. . .
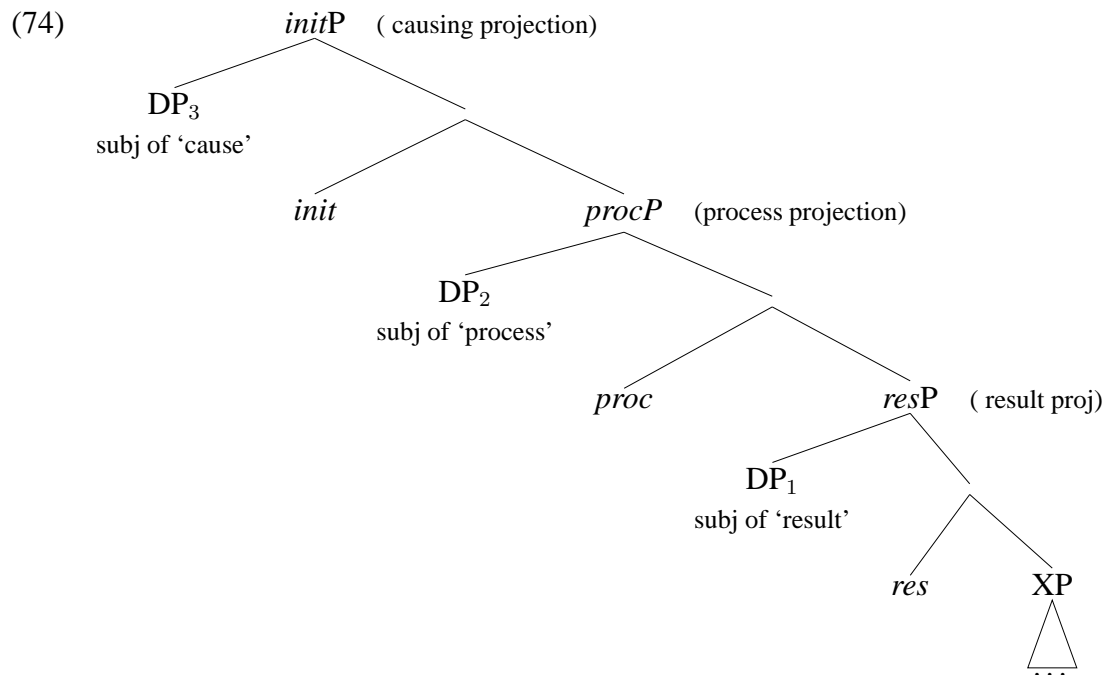
Where subevents are related by an embedding causal relation, and where non-event complements must be co-describe the eventuality identified by the head. In the latter case, they must denote a scale (or derived scale) that can unify with the event head via a homomorphism. Specifier positions represent the thematic participants related to individual subevents.

Verbs have category features which indicates that they can lexically encyclopaedically identify that particular subevent. Thematic relations are determined by their configuration within the system above. In principle, the thematic participants available are: INITIATOR, UNDERGOER, RESULTEE, PATH, RESULT-RHEME. However, many more than these are possible because of the availability of composite thematic relations related by movement. A summary of the lexical verb types found in English and discussed in this chapter is given below in (75).

	[*init, proc*]		
I	Transitive	INITIATOR, UNDERGOER	*drive, push, paint*
	Transitive	INITIATOR, PATH	*eat, read, paint*
II	Intransitive	INITIATOR$_i$, UNDERGOER$_i$	*run, dance*
	[*init, proc, res*]		
III	Transitive	INITIATOR, UNDERGOER$_i$, RESULTEE$_i$	*throw, defuse*
	Transitive	INITIATOR$_i$, UNDERGOER$_i$, RESULT-RHEME	*enter*
IV	Intransitive	INITIATOR$_i$, UNDERGOER$_i$, RESULTEE$_i$	*arrive, jump*
V	Ditransitive	INITIATOR, UNDERGOER PATHPP	*give, show*
	proc		
VI	Intransitive	UNDERGOER	*melt, dry, freeze*
	proc, res		
VII	Intransitive	UNDERGOER$_i$, RESULTEE$_i$	*break, tear*

Unaccusatives are verbs in this system which independently identify no *init* subevent, but which are augmentable via the null default *init* head in English. Unergatives have a single argument that is an INITIATOR (whether or not it also carries other participant entailments).

As far as the connection to traditional aspectual classes goes, the following appears to be the case: 'activities' correspond to either [*init, proc*] or [*proc*] verbs; 'accomplishments' are [*init, proc*] verbs with incremental theme or PATH complements; 'achievements' are [*init, proc, res*], or [*proc, res*]; semelfactives are verbs ambiguous between [*proc*] and [*proc, res*]; degree achievements are [*proc*] verbs with an implicit property scale path.

There is no single projection in this system which carries a [+telic] feature. Rather, telicity emerges from a number of different interacting factors. In the absence of secondary aspectual modification, however, the existence of *res*P does give rise to telicity. Class III, IV, V and VII are default telic and are also punctual. Class I is telic when the PATH argument is bounded, class VI, when there is an endpoint on the scale of change implied (as in Hay, Kennedy, and Levin 1999).

Chapter 5

Paths and Results

5.1   PPs: Paths and Places

In order to investigate the interaction between full prepositional phrases and resultative formation, we need to first be more explicit about the internal structure of prepositional phrases. Following Jackendoff 1983 in the conceptual domain, we need to make a distinction between PATH and PLACE prepositions. Recent work on the syntactic behaviour of PPs has converged on the idea that the P head must be decomposed into Path and Place, with the Path head embedding the PlaceP in the structure (van Riemsdijk and Huybregts 2002), Koopman 2000, van Riemsdijk 1990, Svenonius 2004b, Kracht 2002

(1) PathP

Path   PlaceP

Place   DP

GROUND
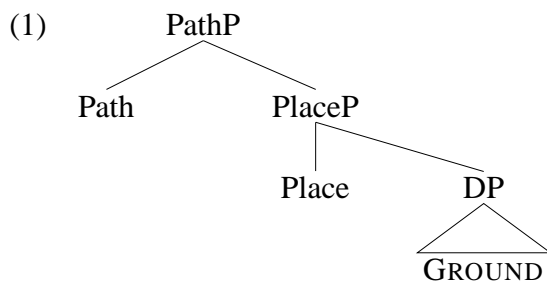
   This decomposition also corresponds to the semantics: Zwarts 2005 and Zwarts and Winter 2000 argue that paths are constructed from place denotations in a compositional fashion. In languages where distinctive morphology is found, the place morpheme is always closer to the root than path morphology (cf. Svenonius 2004b, Kracht 2002). In addition, there is an analogue to telicity/boundedness

in the domain of PPs, which according to (Zwarts 2005), can be characterized as cumulativity under path concatenation. Thus, pathPs can be bounded (noncumulative) or unbounded (cumulative) . They can also be distinguished according to the role that the embedded PlaceP plays in defining the path: Path heads can be at least TO, FROM and VIA (according to Svenonius 2004b). Some straightforward examples are shown in (2) below.

(2) (a) *in the house* is a PlaceP
     (b) *into the house* is a bounded TO PathP
     (c) *toward the house* is an unbounded TO PathP
     (d) *under the bridge* is ambiguous between being a PlaceP or a bounded VIA/TO PathP.

According to the system being proposed in this monograph, PathPs can be the complement of a *proc* head in the verbal decomposition. Just as a quantized DP path object gives rise to a bounded event with creation/consumption verbs, so a bounded PathP complement will give rise to a bounded event with a dynamic motion verb. For a verb like *dance* in English, this is straightforward, with goal of motion readings arising with bounded PathPs (a,b), but not with unbounded PathPs (c), or with PlacePs (d).

(3) (a)Mary danced to the store.   *goal of motion*
     (b) Mary danced into the room.   *goal of motion*
     (c) Mary danced towards the bridge.   *directed path*
     (d) Mary danced in the park   *location of motion*

The first important consequence of this view is that we do not want to conflate goal of motion constructions with the existence of *res*P: a bounded reading will arise with a PathP complement of *proc* as long as that PathP has a bounded denotation.

However, it is possible for a 'goal' interpretation to arise, even with a purely locative (Place) preposition, provided the verb is chosen carefully. Consider the pattern with the English verb *jump* below (4).

(4) (a)Mary jumped to the store.   *goal of motion*
     (b) Mary jumped into the room.   *goal of motion*
     (c) Mary jumped toward the bridge.   *directed path*
     (d) Mary jumped in the water   *goal of motion; location of motion*

Notice that while *jump* is ambiguous between a punctual and repeated activity reading, only the former licenses the goal of motion interpretation in (d) above. Specifically, verbs in English that are obligatorily telic (punctual readings of semelfactive verbs e.g.) allow a purely locative PP ('in the water') to name a *final* location, while activity process verbs like *dance* do not.[1]

Indeed, in a crosslinguistic survey of languages as diverse as Spanish, Icelandic, Korean and Finnish, we find this pattern repeated. In each case, the language in question allows a subset of verb types to appear with locative PPs to express goal of motion, and in each case the punctual/telic verbs seem to fall into this class (The data and generalizations in this area come directly from the results of the *Moving Right Along* seminar on Adpositions led by Peter Svenonius, at the University of Tromsø in Autumn 2005 and Spring 2006, the results of which can be accessed at the following URL:http://www.hum.uit.no/mra/).

To illustrate the pattern in detail, I present the data from Korean (Son 2005). In Korean, the following set of prepositions is used to express location and goal meanings, with a further division according to whether they combine with static eventualities or dynamic ones, and a systematic distinction between animate and inanimate (although we will be ignoring the latter distinction here).

(5)	**Location (in/at/on)**	**Goal Path (to)**
	Static (BE AT): *-eykey* [animate]/*ey* [inanimate]	
	Dynamic (HAPPEN AT): *-eyse* [inanimate]	*-kkaci/-(u)lo-* 'until/to'

---

[1]There is an intermediate class of verbs, such as *run*, *walk* or *crawl* which seem to show variable behaviour across dialects of English. For the author, those verbs pattern with *dance*, while for other speakers they pattern more like *jump* in allowing final locations to be named by locative PlacePs. However, even for these speakers, the possibility seems to be dependent on the availability of a 'threshold-crossing' interpretation of the event. In (i) below, the final location interpretation is more difficult to get than in (ii). And even the author accepts the final location reading in (iii).

(i) Mary walked in the park.
(ii) Mary walked in the room.
(iii) Mary walked in the door.

One possibility is that the availability of this reading is systematically correlated with an interpretation of the predicate as licensing a *res* head in the decomposition. The other is that there is a null Path head licensed in these structures in English with the default semantics of 'phase transition' of some sort. I remain agnostic about which of these two possibilities is correct, and will abstract away from speaker differences here, concentrating on the core cases of my own British dialect.

In (6), we see a PlaceP modifying a state, and in (7), we see one modifying an activity (a *proc* verb).

(6) Sean-i   pang--*ey*   iss-ta
    Sean-NOM room-LOC be-DEC
    'Sean is in the room.'

(7) John-i   atul-kwa kongwon-*eyse* nal-ass-ta
    John-NOM son-WITH park-LOC   play-PAST-DEC
    'John played with his son in the park.'

In (8), a goal preposition, presumably a bounded PathP in this system, combines with s a *proc* verb to give a goal interpretation.

(8) Inho-ka   kichayek--*ulo*   kuphakey ttwi-ess-ta
    Inho-NOM train.station-DIR in a hurry run-PAST-DEC
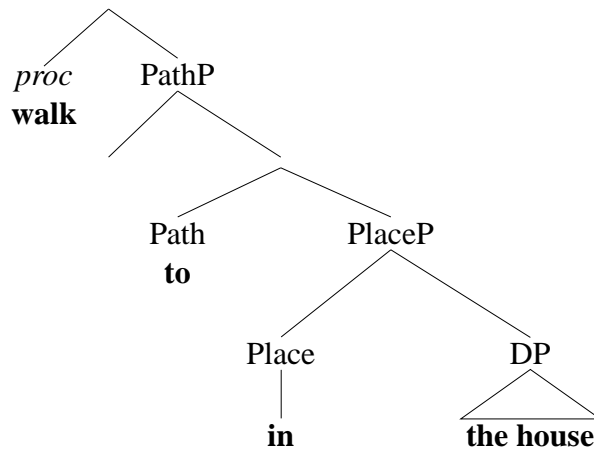   'Inho ran to the train station in a hurry.'

The striking fact is that In Korean, the purely locative series can also give rise to goal interpretations when embedded under punctual directed motion verbs (9). In this case, the goal PP option is ungrammatical (10).

(9) John-i   patak-*ey* ssuleci-ess-ta
    John-NOM floor-LOC fell.down-PAST-DEC
    'John fell down on the floor.'

(10) *John-i   patak-*ulo* ssuleci-ess-ta
     John-NOM floor-LOC fell.down-PAST-DEC
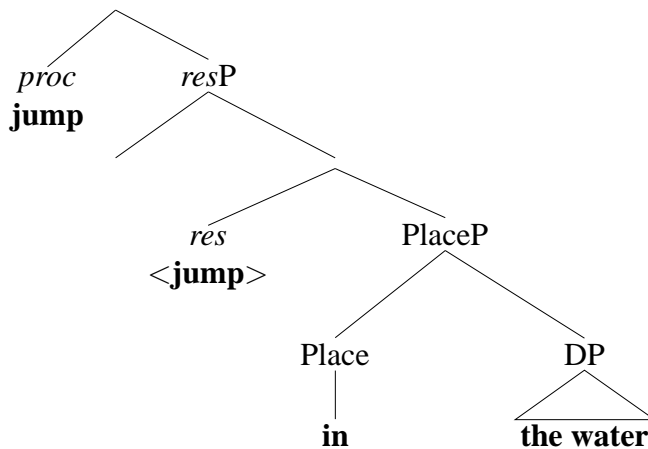   'John fell down on the floor.'

The straightforward claim is that verbs that contain *res*Ps in their representation must combine with PlacePs by event-complement composition. The semantics of the *res* head will straightforwardly give rise to the 'goal' interpretation of that location.

(11)

```
      proc      PathP
      walk
              Path        PlaceP
               to
                      Place        DP
                       in      the house
```

On the other hand, verbs that only contain *proc*Ps in their representation must combine with PathPs to get a directed motion interpretation. If that PathP is bounded, it will give rise to a 'goal' interpretation via event-path homomorphic unity.

(12)

```
      proc      resP
      jump
              res          PlaceP
             <jump>
                      Place        DP
                       in      the water
```

Interestingly, a few verbs, like 'go' and 'come' in Korean allow both PlacePs and PathPs interpreted as goals. These are verbs, by hypothesis that have both *res*P and non-*res*P versions. There is a subtle meaning difference, however: in the *proc* + Path version, the undergoer does not actually have to reach the final location (13); in the *res* + Place version the final state interpretation is unavoidable (14).

(13) Mary-ka   cip-*ulo*   ttwi-e   ka-ss-ta
  Mary-NOM house-DIR run-LINKER go-PAST-DEC
  'Mary ran to the house.'
  (Undergoer of the motion does not have to reach the Ground final location)

(14) Mary-ka   cip-*ey*   ttwi-e   ka-ss-ta
  Mary-NOM house-LOC run-LINKER go-PAST-DEC
  'Mary ran to the house.'
  (Implies that the undergoer of motion reaches the final location expressed
  by Ground DP)

The idea that the goal interpretation of locatives is dependent on the *res* projection gets confirmation from that fact that when these verbs are used with an aspectual form (the perfect) that explicitly requires a target state, only the locative PP is grammatical.

(15) Inho-ka   samwusil -*ey* ka-a   iss-ta
  Inho-NOM office-LOC   go-LINKER be-DEC
  'Inho has gone to the office (and is still there).'

(16) *Inho-ka   samwusil -*lo* ka-a   iss-ta
  Inho-NOM office-DIR   go-LINKER be-DEC
  'Inho has gone to the office (and is still there).'

Thus, the data from English and Korean show that genuine PlaceP goal of motion is indeed possible, but only when the verb itself independently licenses a *res* projection. Thus, for English, verbs under a punctual interpretation allow a simple locative preposition to name a final location (17a). On the other hand, locative prepositional phrases are ungrammatical with pure process verbs, under a goal of motion reading (17b).

(17) (a) Michael pushed the car in the ditch.
  (b) *Michael danced Karena in the room.

In contrast to Place prepositions, PathP phrases are grammatical with process verbs and can express both bounded paths (a) as well as unbounded paths (b).

(18) (a) Michael drove the car into the ditch.
  (b) Michael drove the car towards Edinburgh.

More surprisingly, there are also cases of PathPs introducing 'unselected' objects with pure process verbs, and once again this is independent of whether the PathP in question is bounded (a), or unbounded (b).

(19) (a) Alex danced the puppet into the room.
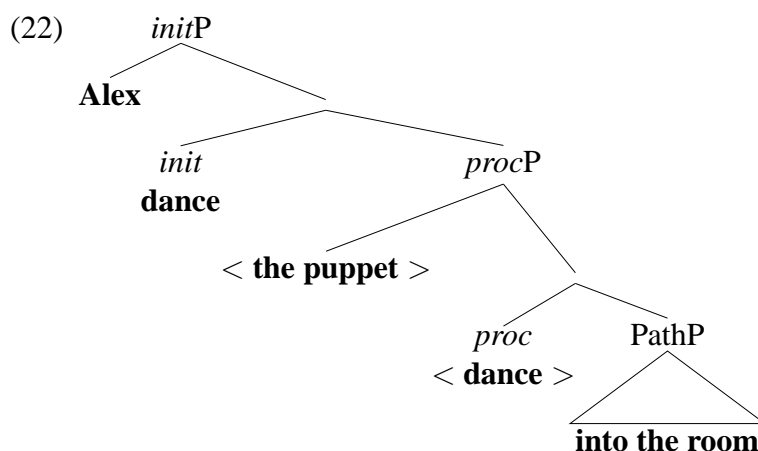   (b) Kayleigh walked Ariel round and round the room

Cases like (19b) above show that no *res*P need be involved to licence the 'unselected' object since the resulting predication is atelic. To my knowledge this type of sentence was first explicitly noticed and analysed in Folli and Harley 2006.

(20) *PP unbounded path, with unselected object*:
     (a) Bill waltzed Mary round the campfire.
     (b)*Bill waltzed Mary.

Under the first phase syntactic principles being explored here, telicity can arise because of a bounded path in the complement of process. If this is the right analysis of motion verbs with PathP complements, then many cases of so-called PP resultatives are actually of the non-*res*P type, even when they are telic and have unselected objects. I assume that this is the case for the following 'telic' PP constructions as well.

(21) *PP bounded path, with unselected object*:
     (a) Michael ran Karena to the coconut tree.
     (b) Alex danced the puppet into the the room.

One option here to analyse the directional PPs as being independent of the predicational structure of the verb, since they always have the possibility of being attached as adjuncts. However, because of their role in licensing an 'extra' object the availability of a lower attachment affecting the argument structure must also exist for PathPs. Thus, I will argue that the first phase decompositions of sentences of the above type should be as in (22).

(22)   *init*P

      Alex

              init   *proc*P

              dance

                      < **the puppet** >

                              proc   PathP

                              < **dance** >

                                          into the room

My claim about intransitives of motion has been that they represent a situation where the single DP argument possesses the composite role of INITIATOR and UNDERGOER.[2] I argue that the complex event formed from *proc* path homomorphism allows the relaxation of the requirement that the INITIATOR and UNDERGOER of a motion verb be identical. In other words, you cannot 'dance' somebody because the instigation of dancing per se is something that is under the person's own direct control. However, 'dancing someone around the room' can be initiated by someone else because in the absence of their instigation, the dancer's path of motion would have been different. This difference in lexical specification of the event via the PP path allows INITIATOR to be distinct from UNDERGOER and thus the illusion of an extra argument position. We have independent evidence that this requirement that INITIATOR and UNDERGOER be identical with motion verbs can be relaxed under particular circumstances, either when the UNDERGOER is a coercible animate in a conventionalized process as in (23), or when the lexical encyclopædic requirements on the motion verb are relaxed/abstract enough to be applicable to inanimates as in (24). The situation of PathP complements is another way in which real world knowledge intervenes to allow a single INITIATOR to affect someone else's motion.

(23) (a) Karena walked the dog.
     (b) Michael jumped the horse.

---

[2]Thus, the verbs in this class that are termed 'unergative' in the literature, do not have DP subjects that are identical semantically to the subjects of transitives, but rather have semantic entailments in common with both 'external' arguments and 'internal' arguments in the traditional sense. This, I believe, is the reason why motion verbs exhibit ambiguous behaviour across languages, with different linguistic diagnostics being sensitive either to *Initiator* or UNDERGOER structural positions, giving rise to different options and a certain amount of janus-like behaviour.

(24) (a) Alex ran the bath water.
     (b) Kayleigh ran the meeting.
     (c) Karena ran Ariel's life.

It should be clear from this discussion that neither 'telicization' nor the possibility or 'causativizing' so called unergative intransitives is correlated with a single kind of syntactic representation. An already punctual/telic verb can be augmented with a PlaceP as the complement of *res*; a process motion verb can have both bounded and unbounded PathPs in the complement position to *proc*. Argument structure flexibility is an important feature of the analyses proposed here: distinct INITIATOR and UNDERGOER are possible for motion verbs under these circumstances, giving the appearance of an extra argument, although the actual number of structural positions does not change. In fact, I have argued here that the majority of cases that have been called PP resultatives do not involve an extra predicational structure in the first phase decomposition at all: PlacePs and PathPs are complements of *res* and *proc* respectively, which are independently licensed by the particular motion verb. This will be in contrast to AP results and particle resultatives to be discussed below, where I will argue that a *res* head can be identified in the absence of verbal specification. This claim has implications for crosslinguistic generalizations about result augmentation: while the double object construction, and particle shift involve a special lexical identification of *res*, PP resultatives in English do not utilize any such special *res* lexical item. Thus, it is not surprising that the Romance languages which fail to have the double object construction, do in fact have PP resultatives and many instances of 'goal of motion' constructions which turn out to be dependent on the particular choice of verb (see Folli 2003 and Folli and Ramchand 2005 for data and discussion).

5.2 APs: Paths and Results

AP resultatives are found with great productivity in English[3], with both selected and unselected objects (Carrier and Randall 1992, McIntyre 2001, Wechsler 2005 inter alia).

(25) *AP results with selected objects*:
   (a) John hammered the metal flat.

---

[3]There are of course a host of constraints and restrictions as well, some having to do with real world knowledge, and others, as I will discuss below, related to the semantic denotational possibilities of both adjective and verb (Wechsler 2005)

    (b) Mary broke the safe open.
    (c) Bill painted the door red.

(26) *AP results with unselected objects*:
    (a) John ran his shoes ragged.
    (b) Mary sang the baby asleep.
    (c) Bill coughed himself hoarse.
    (d) John wiped the table clean.

Wechsler 2001b points out on the basis of an extensive corpus study that in English AP results with selected objects are always formed from adjectives that are *gradable* and CLOSED SCALE (see Kennedy and McNally 2005). As I argued in chapter 3, gradable adjectives represent the property analogue of a scalar path (see also Hay, Kennedy, and Levin 1999) which is equivalent to PathPs in the prepositional domain, and incremental theme objects of consumption verbs. This restriction would follow under the *homomorphic unity* requirement, from the assumption that AP resultatives of this type are actually the complement of the *proc* head directly, with no intervening *res* projection: the telicity of the resulting VP arises because the AP is *closed scale* and hence gives rise to a bounded path.

(27)
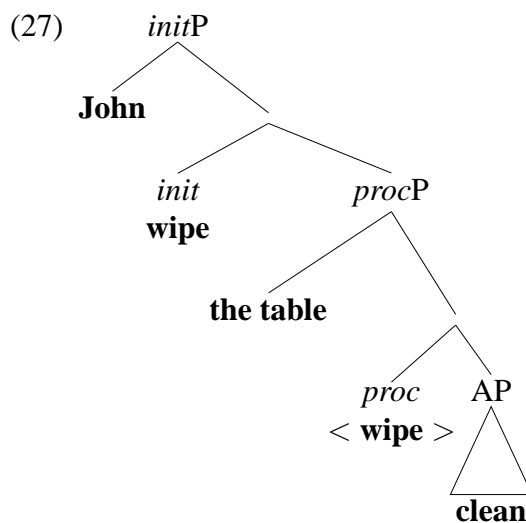
Since there is no special *res* head in these constructions, we might predict that a language like Italian would have resultatives of this type, contrary to fact (28a). However, this seems to be an independent fact about adjectives in Italian, which do not seem to be able to denote path structure. Folli 2003 notes that if the

adjective is doubled as in (28b), or made comparative as in (28c), the resultatives are indeed possible.

(28) (a) *Gianni ha martellato el metalo piatto.
   (b) Gianni ha martellato el metalo piatto piatto.
   (c) The tailor shortened the skirt very short.

Wechsler 2001b further notes that there does *not* seem to be a clear homomorphism requirement in the case of the AP resultatives that have unselected objects. I assume that this is due to the fact that the AP in question sits in the complement position of a distinct result state subevent– i.e. it is a full small clause mediated by the *res* head itself. It is the semantics of the *res* head that creates the entailments of result and this makes the scalar structure of the adjective irrelevant so long the adjective itself can refer to a static property (29).

(29)
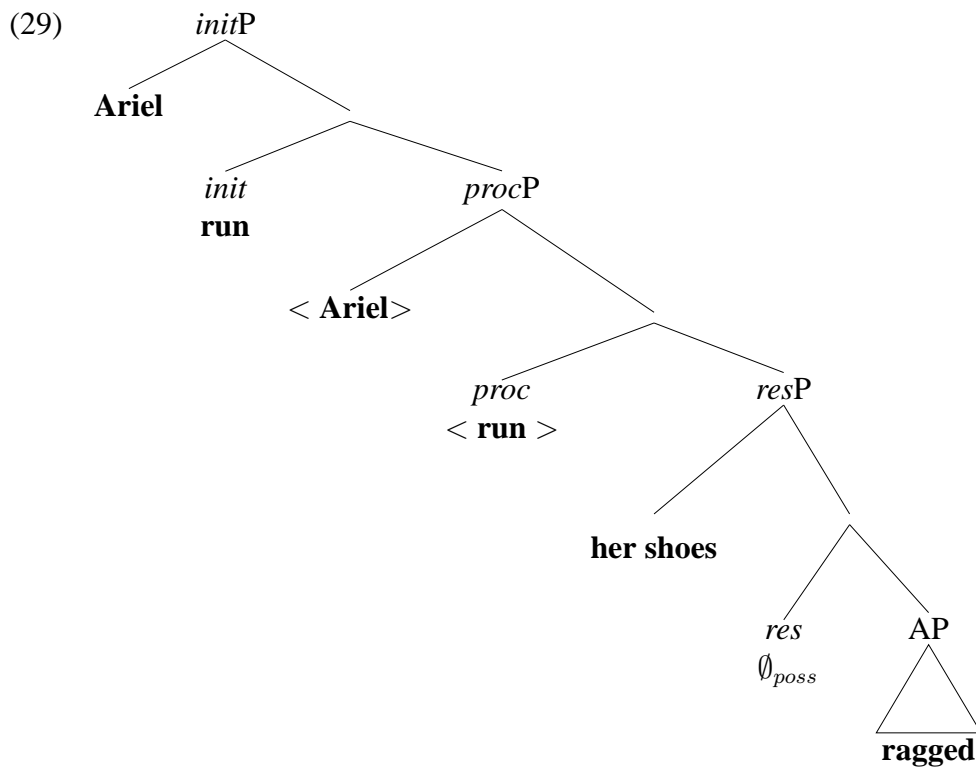
The null *res* head required for predication here must have very general semantics of 'possession', where the 'shoes' in the sentence above come to possess the

property of being 'ragged'. If we assume that property possession and object possession can be handled with the same abstract semantics, then this is the very *res* head that we had to assume mediated the predication in the case of the English double object construction.

The claim here therefore is that a language like Italian that lacks this particular lexical item (the null possessional *res* head), will systematically lack both double object constructions and the type of adjectival resultative with unselected objects as shown above.

In English, if a verb is consistent with the semantics of $\emptyset_{poss}$, an AP *and* an extra predicational position will be licensed, under the assumption that APs do not independenly allow one. AP results where no extra predicational position is introduced will always have to be the complement of a *proc* head directly, hence the correlation between homomorphism constraints on the adjective and the lack of unselected object, as noted by Wechsler (2001b).

5.3   Types of Resultatives in the First Phase

We have seen that verbs which contain both initiation and process can usually be systematically augmented in English by means of a secondary predicate (adjective or particle) which describes a final result property or location arrived at by a thematic argument. This has been described in detail in the literature (Carrier and Randall 1992, Hoekstra 1988, Kaufmann and Wunderlich 1998, Levin and Rappaport Hovav 1995) and has received various labels: 'template augmentation' (Levin and Rappaport 1998), 'telic pair formation' (Higginbotham 2001), 'accomplishment formation' (Pustejovsky 1991, Parsons 1990).

As we have seen, in some cases of resultative augmentation, an extra, or 'unselected' object shows up which would not otherwise be licensed by the verb on its own. This is often correlated with the existence of additional predicational structure, given by the secondary predicate in the complement of *res*. But, as we have also seen, the existence of an 'extra' object does not necessarily mean that there is a *res*P in the structure. On the other hand, we know that a resultative secondary predicate must be stative to be the complement of the *res* head directly, by homomorphic unity. In the case of AP result predications, and the particle predications above, this seems to be the case: the shoes come to be 'ragged' and the homework comes to be 'in'. These truly resultative predications must be dependent on the lexical possibilities of the language for identifying *res*. In many cases when *res*P is present it is not identified by the root itself but by a null *res* head which takes

the secondary predicative small clause as its complement. We saw one such *res* head already in English in our discussion of the double object structure— the null result possessional head. In the case of adjectival results with unselected objects, I have assumed that the very same head is involved and mediates the predicational relation between the AP and its 'subject', which is simultaneously the RESULTEE of the predication.

For these cases of result augmentation, the 'unselected' argument is a pure RESULTEE, and not an UNDERGOER of the process lexically identified by the verb. So for example, the shoes in (29) do not 'run' . To be sure, the DP objects in question do undergo some process which results in them being 'ragged', but this is a matter of real world knowledge. The semantic interpretations I have specified for these structures ensures that the specifier of the process must undergo the very process that is lexically/encyclopedically identified by the root verb.

However, the the secondary predicate in question does form part of the event building portion of the clause and hence creates a complex predicational structure rather than an adjunct structure. This can be seen immediately from the fact that (i) the object only becomes possible in the context of secondary predication, (ii) it is interpreted as being both the 'subject' of the secondary predicate and the holder of the result state, and (iii) it receives accusative case from the verb. In the case of *run*, the verb does not license a separate argument in UNDERGOER position at all. This is because the INITIATOR and UNDERGOER are coindexed for this verb in the normal case, so no distinct direct object is possible.

It is also possible to find a secondary predicate describing the result, where there does not seem to be an internal argument *added*— in these cases, the base verb already licenses an argument in UNDERGOER position. However, even here there is evidence of extra predicational structure, since the already existing object acquires new entailments because of the licensing and identification of the *res*P in the structure. I will assume therefore that the direct objects in (30) and (31) below are all RESULTEE-UNDERGOERS.
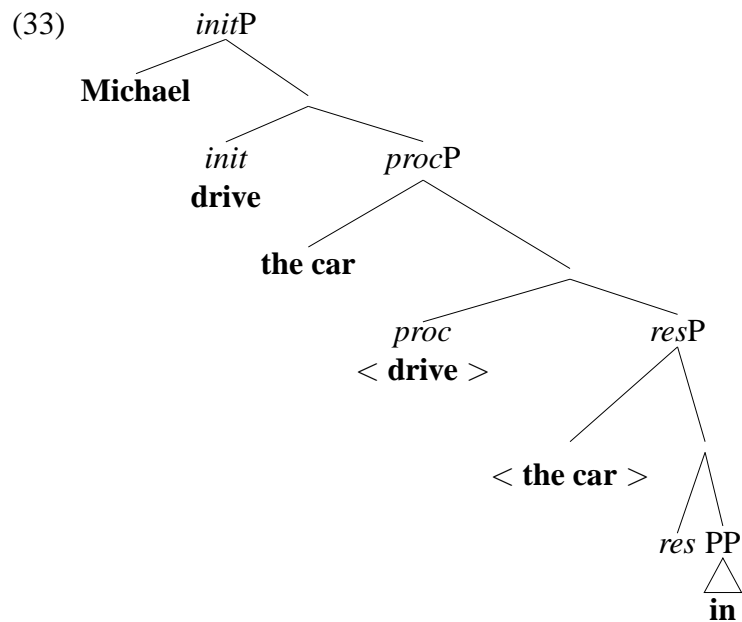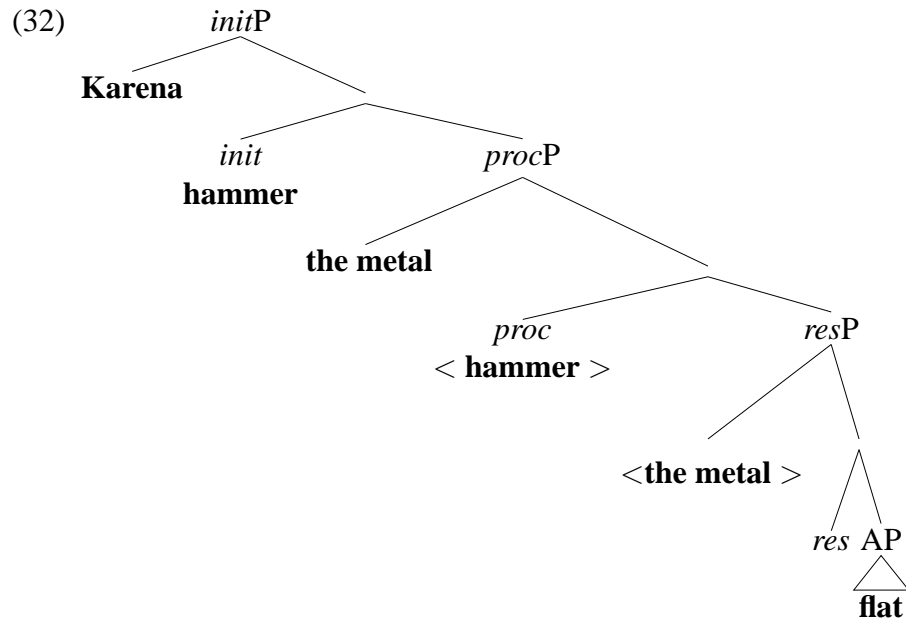
(30) *AP result, no change in transitivity*
    (a) Karena hammered the metal flat.
    (b) Karena hammered the metal.

(31) *Particle result, no change in transitivity*
    (a) Michael drove the car in.
   (b) Michael drove the car.

In the spirit of composed thematic relationships, the DP object in question is simultaneously the specifier of *proc* as before (UNDERGOER) as well as the the specifier of the result projection (the RESULTEE) which is described by the AP or Particle phrase.

(32)

```
                initP
         Karena /    \
                   init      procP
                  hammer   /      \
                      the metal /       \
                             proc          resP
                          < hammer >    /      \
                                   <the metal >  \
                                              res  AP
                                                  /\
                                                 flat
```

(33)

```
                initP
        Michael /    \
                   init      procP
                  drive    /      \
                     the car /       \
                          proc          resP
                        < drive >    /      \
                                < the car >   \
                                            res  PP
                                                /\
                                                in
```

Given the flexibilities of first phase syntax, there is a third logical possibility: since *res* exists for telic verbs even when there is no predicational complement for it, a secondary predicational structure can be added to verbs that already independently identify a result. In this case, all the secondary predicate does is further specify the final state expressed by *res* (in this case though, the secondary predicate must be non-gradable/locational). All that changes here is that the result becomes more specific, and the direct object gains the entailments that result from being the subject of that embedded predicational structure, but the aktionsart of the event does not actually change. The cases that fall into this category are the ones shown in (34) below, and the first phase representation would be as in (35).

(34) (a) John broke the box open.
       (b) John broke the vase in pieces.

(35)
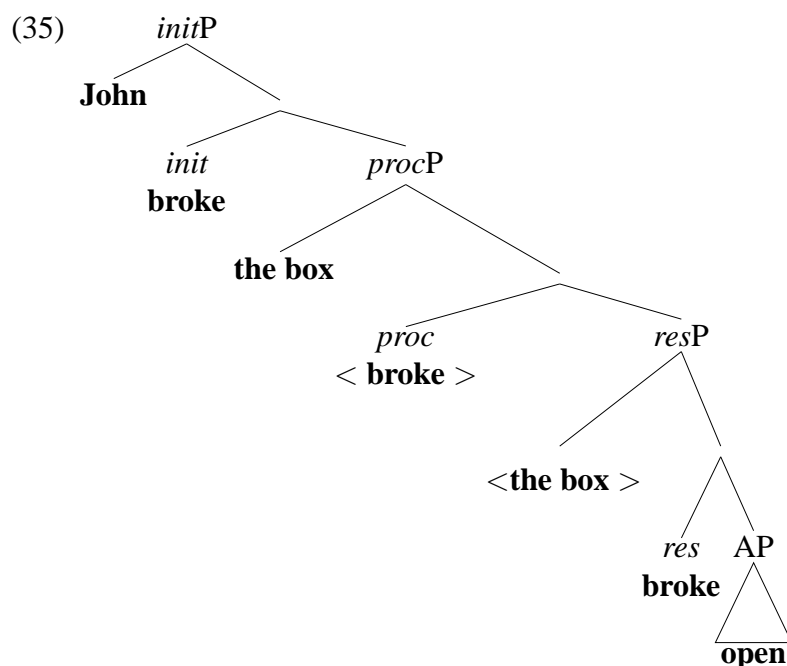
5.3.1   Direct vs. Indirect Resultatives

By now, it is clear that structures that have been called 'resultative' in the literature are a heterogeneous class. In the previous section on full PP complementation, we saw that 'goal of motion' constructions do not necessarily involve a *res*P. Even if there is a *res*P in the structure, the direct object can variously be either just a

pure RESULTEE or a RESULTEE-UNDERGOER. Differences in types of resultative have been noticed before. Levin and Rappaport-Hovav 1999 propose a distinction between two types of resultative construction, which I give here below.

- A causative event structure consisting of two subevents formed from the conflation of temporally-independent events

- A simple event structure formed from the conflation of two temporally-dependent "coidentified" events.

(pp 63)

I will call the first class the *indirect' resultatives* and the second *direct resultatives*. However, in the terms being explored in this monograph, both types involve can causationally dependent subevents, in involving a relation between the *proc* subevent and the *res* subevent.

Direct Resultatives

 (36) (a) The lake froze solid.
        (b) John bottle broke open.
        (c) The mirror shattered to pieces.
        (d) John broke the bottle open.
        (e) The police shot the robber dead.

Indirect Resultatives

 (37) (a) John sang himself hoarse.
        (b) Mary sneezed the napkin off the table.

Superficially, it appears that resultative formation with unergatives and unselected objects, give rise to 'indirect' resultatives. Transitive verbs with selected objects and unaccusatives, give rise to the 'direct' resultatives. This is not exactly the claim in Levin and Rappaport-Hovav 1999, who rely on independent entailment tests and synonymy judgements to isolate the two classes.

I believe that the distinction argued for in Levin and Rappaport-Hovav 1999 is real, and is important in the classification of resultatives, although it corresponds to a slightly different analytical set of options than they assume. It is important to bear in mind that the first phase decompositions I have been exploring involve event variables, and no explicit reference to time at all. Thus, the classification of

resultatives in terms of temporal dependence or independence cannot be a direct effect of these representations, but only an indirect one that arises when these complex events are mapped to a temporal time line.

Since the eventive composition is mediated by causational glue, and not mere temporal precedence, there should be no direct requirement that each subevent in a causational chain temporally precede the other. However, there *are* some coherence conditions that seem to be applicable. I propose the following two constraints on *init-proc* coherence and *proc-res* coherence respectively.

(38) *Init-Proc Coherence*:
    Given a decomposition $e_1 \rightarrow (e_2 \rightarrow e_3)$, e_1 may temporally overlap e_2.

(39) *Proc-Res Coherence*:
    Given a decomposition $e_1 \rightarrow (e_2 \rightarrow e_3)$, e_3 must *not* temporally overlap e_2. (although they may share a transition point).

Since *init* leads to *proc* and *proc* is extended, *init* may either be a conditioning state that preexists the process, that coexists with the process, or is a continuous initiation homomorphic with it (see also Svenonius 2002). Since a result state is by definition something whose existence does not preexist the process, the result state must *not* temporally overlap *proc*, but if they are temporally dependent, then they abutt, giving rise to a transition point which links the end of the process with the beginning of the result state. With these constraints in hand, we can now state the relationship between the first phase decompositions and the kind of temporal dependence isolated by Levin and Rappaport-Hovav. I will assume that temporal constraints exist and that they are affected by which lexical item(s) in the decomposition actually bear the tense feature. I propose to capture the difference between direct and indirect causation by means of the following constraint on time-event mapping.

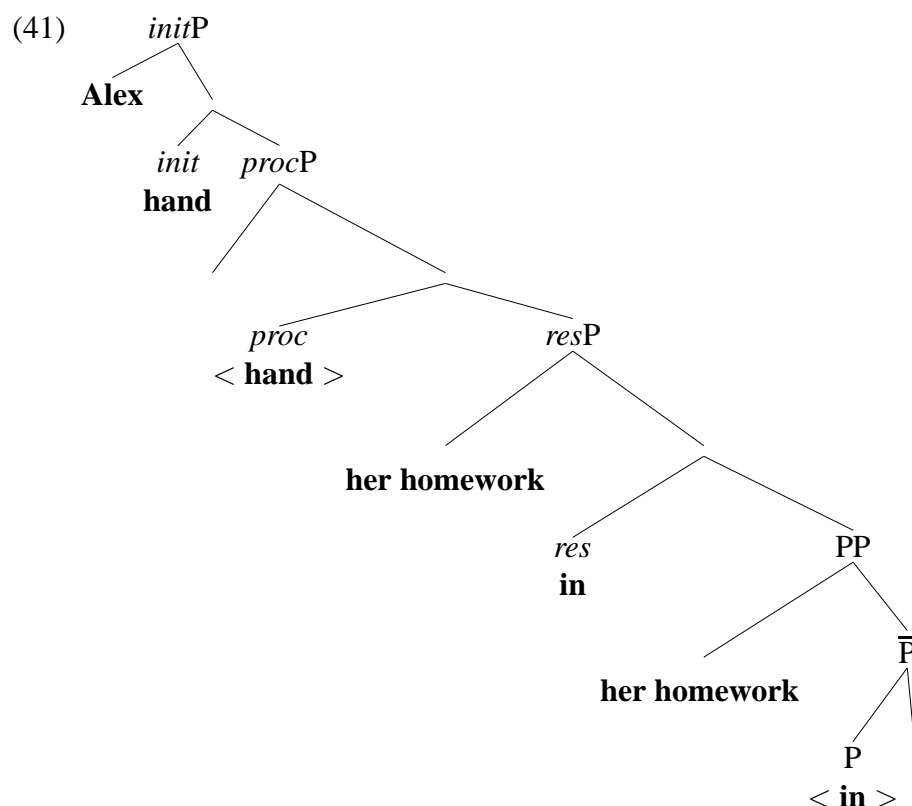(40) *Temporal Dependence and Lexical Identification*
    Temporal dependence is required for subevents identified by the *same* lexical content.

Thus, in the types of resultatives discussed above, the resultatives formed from process verbs with a null *res* head will be indirect, or temporally independent resultatives. Those where the main verb already independently identifies *res* will be the direct resultatives. In addition, bounded predications which arise from a PathP in the complement of *proc* will also be temporally dependent, since there is no independent *res* head and *proc* and the PathP are identified by homomorphic unity.

5.4   The Verb-Particle Construction

So far, I have been tacitly assuming that particles are simply P elements which happen not to have explicit complements. This is a view that has been defended in the literature, where 'particles' are simply intransitive versions of prepositions (Emonds 1976), ones which in the terms of Svenonius (1994b), Svenonius (1996) have implicit or incorporated GROUND elements. Thus, resultative predication with particles is simply a subcase of the prepositional variety, with no overt complement of P present.

However, as is well known, the verb-particle construction has some interesting properties which set it apart from other kinds of result augmentation. Most famously, these constructions undergo the notorious 'particle shift'. While many different proposals exist in the literature for analysing these constructions, I will follow the analysis of Ramchand and Svenonius (2002), building on previous work in Svenonius 1994b and Svenonius 1996. The difference between ordinary resultatives and the verb-particle construction is that the particle itself can identify the *res* head in the structure, giving rise to the V-prt order if the the DP stays low in the embedded PP (41). In the particle construction therefore, we have evidence for a PP-internal 'subject' position– the small clause subject of the prepositional phrase. I will assume this position more explicitly in the phrase structure trees that follow, since its existence is crucial to the predicational argument and to the explanations of particle-shift.

(41)

```
            initP
           /    \
        Alex      \
              init  procP
              hand  /    \
                 proc     resP
               < hand >  /    \
                 her homework  \
                            res    PP
                            in    /   \
                          her homework  \
                                       P̄
                                      /  \
                                     P    \
                                  < in >
```

In what follows, I will actually assume that the particle moves *obligatorily* to *res*, and that the word order variation results from whether the DP object is spelled out in its lowest or its highest predicational position.[4]

Thus, particles have a special status within the class of result augmentations more generally, in that they are (i) heads and (ii) have the requisite featural properties to identify the *res* head in a verbal decomposition. Thus neither Ps with complements, nor adjectives within an AP small clause give rise to shift, even when embedded under *res*, as is well known (Svenonius 1994b).

(42) (a) *Alex sneezed off the napkin the table.
     (b) *Ariel ran ragged her shoes.

In Ramchand and Svenonius 2002 we argue that the first phase decompositional account of the Verb-particle construction makes sense of the otherwise para-

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[4]This is different from what was argued in Ramchand and Svenonius 2002, where the different orders depended on whether head movement of the particle, or DP movement of the internal argument to the specifier position, was chosen as a way to license *res*P.

doxical properties of the construction. It resolves the debate between the small clause approach (Kayne 1985, Guéron 1987 Hoekstra 1988, den Dikken 1995) and the complex predicate approach (Johnson 1991, Neeleman 1994, Stiebels and Wunderlich 1994 Baker 1988, Koopman 1995, Zeller 1999) by essentially representing the crucial correctness of both positions. The small clause approach is correct because the particle is associated with additional predicational structure which thematically affects, and in extreme cases actually licenses the direct object, which is essentially the 'subject' of that introduced small clause. On the other hand, the first phase decomposition is in effect a complex (decomposed) predicate, where the subevents involved combine to create a singular (albeit internally articulated) event. This complex event is a unit for the purposes of case licensing, and idiom formation.

Moreover, analysing particle shift as movement to license/identify the null *res* head avoids the claim that particle shift involves some kind of complex head formation in the syntax. In the analysis of Johnson 1991, V and Prt combine to form a complex morphological word, which then raises to a functional head above VP, μ. However, as pointed out in Svenonius 1994b and Svenonius 1996, the complex head so formed would violate the RHR head rule in English and Scandinavian. Svenonius shows that the problem is particularly striking for Swedish, where particle shift in (43) contrasts with true incorporation in the 'passive' form in (44), which does give the expected right-headed structure.

(43) Det blev   hugget   ned   många träd
     it   became chopped down many trees
     'Many trees got chopped down.'

(44) Det blev   många träd nedhuggna
     It   became many trees down.chopped
     'Many trees got chopped down.'

The argument against either lexical word formation or head movement and incorporation is strengthened by the evidence that in Swedish and Norwegian, the movement of the main verb in V2 contexts can strand the particle, even after 'shift'. Indeed, the particle may never be moved along with the verb under V2 in these languages, demanding a rule of obligatory excorporation if the head movement account were correct (data below from Åfarli 1985).
.

(45) Kari sparka heldigvis   ut   hunden   *Norwegian*
     Kari kicked fortunately out the.dog
     'Kari fortunately kicked the dog out.'

(46) *Kari sparka ut   heldigvis   hunden
     Kari   kicked out fortunately the.dog

The evidence shows that the Verb-particle combination is not either a lexical word nor a complex head under a single syntactic terminal. Because of its effects on argument structure and aktionsart properties, the Verb-particle construction in English and Scandinavian constitutes clear evidence that so-called 'lexical' properties of verbs cannot be confined to a lexical module. Rather, the different components of a complex event are part of a syntactic system which can be lexicalized through independent morphemes.

In the larger context of resultative formations more generally, particles are a special case because they seem to be able to independently identify *res*. The evidence for this is two-fold: firstly, unlike adverbs or even other kinds of resultative predicates, they can appear in a position that disrupts the continuity between verb and object (47).

(47) (a) *John painted red the barn.
      (b) *John threw quickly the ball.
      (c) John threw out the dog.

Secondly, they can create resultative predications even when a normal locative PP will fail to do so with a particular verb (48).

(48) (a) I opened the door, and Mary danced in. (result/goal reading)
      (b) Mary danced in the room. (only the locative reading).

In (48a) above, the verb *dance* cannot identify *res* on its own, and the null *res* head that English has for generalized possession as in the double object construction is not felicitous because we can see that (48b) is bad. Therefore, we must assume that particles can themselves have a *res* feature as part of their lexical specification. In fact, we can also see particles co-occurring with PP complements which are in the complement of *res*. The analysis of (49) below would be that the particle identifies *res*, and that the PP is in the complement position. Note that the order here is rigid, as we would expect, and that *out of the rain* by itself is not sufficient to license a goal of motion reading with this verb which seems to be pure manner of motion.

(49) (a) Mary danced in out of the rain.
      (b) *Mary danced out of the rain in .

(50)
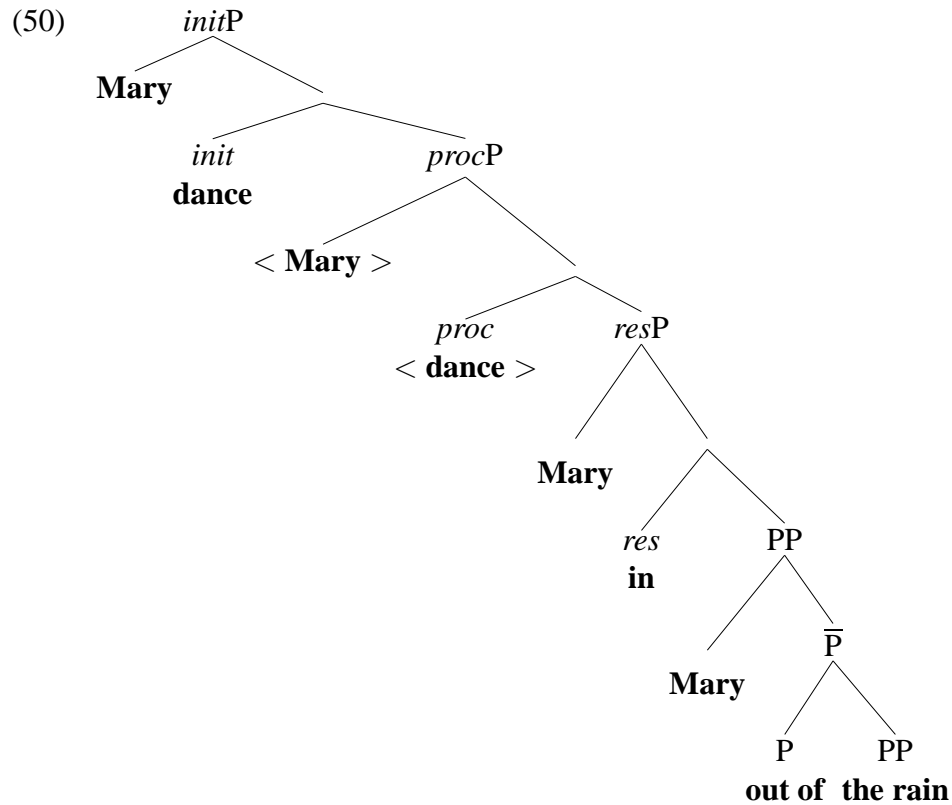
A question now arises concerning what happens when a particle co-occurs with a verb that *does* independently identify result, as in the English verb *break*. These constructions are perfectly grammatical.

(51) (a) John broke the party up.
      (b) John broke up the party.

(52) (a) John broke the handle off.
      (b) John broke off the handle.

We have already argued that PP predications can appear in the complement position of independently identified results. Here the problem is that the particle isn't just a complement of *res*, it *is* a *res*. In the case of *break* it appears that

both verb and particle are competing for the same position. We do not want to say that *break* is simply ambiguous between being a *proc, res* verb and a *proc* verb because a pure process reading simply isn't available in the general case. On the other hand, if we inspect the predicational semantics of these constructions, it appears that the direct object of *break* in (52) does not actually become 'broken', while it certainly becomes 'off'. Its harder to say with example (51) since the particle has such an abstract meaning, although perhaps because of its abstractness one might want to analyse it as a pure *res* head without any embedded specific predicational content at all. If the particle is indeed in *res* in the above examples, then we need a constrained way of allowing *break* to underassociate its category feature precisely when something else identifies that category. In fact, this notion of 'underassociation' will be crucial in the next chapter on morphological causatives. I will constrain underassociation in the following way.

(53) *Underassociation*:
    A lexical item can fail to associate one of its category features, provided that feature is actually available in the structure within the same phase.
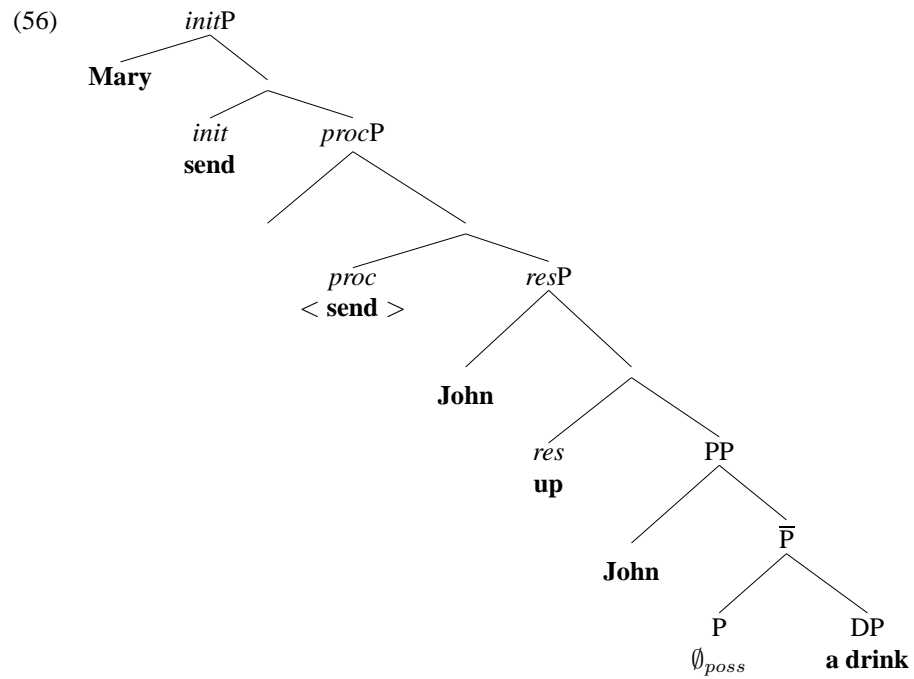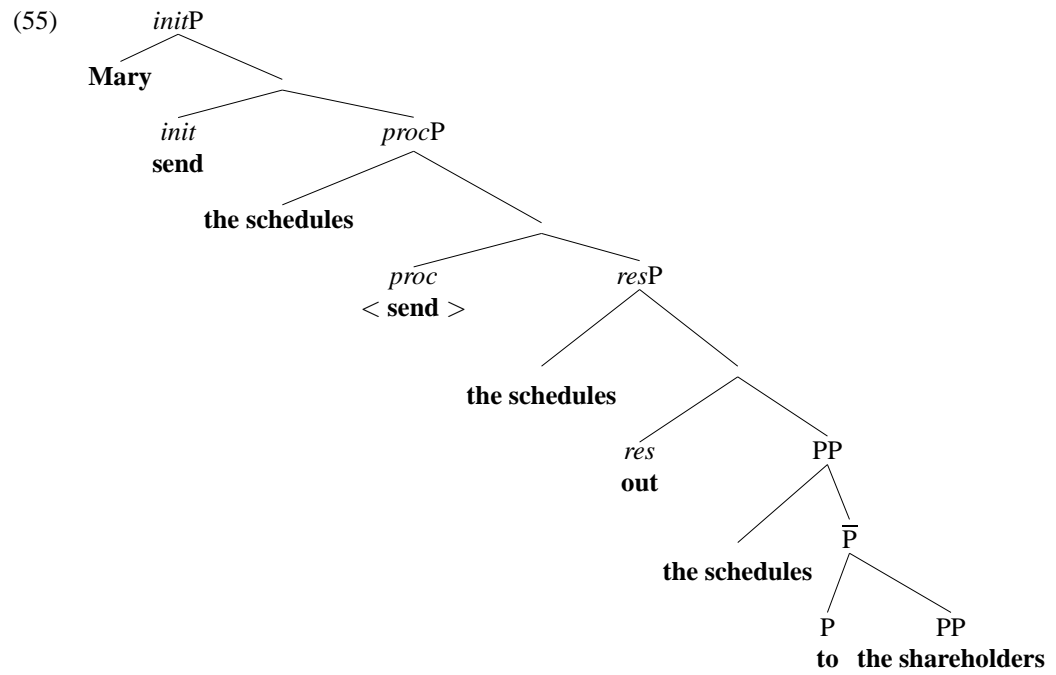
In other words, the category feature on a lexical item can be satisfied in two ways: by actually associating to a node of that category in the structure; or by not associating but agreeing with that feature locally.

This means that the examples in (52) above actually have the particle in *res*, while the *break* verb has an underassociated *res* feature which I assume can be licensed by some syntactic coindexation mechanism (possibly AGREE) because of the *res* head in the tree.

We can force a situation in which the particle really has to be in *res* by looking at cases where a particle cooccurs with a selected PP, as in the well known examples from den Dikken 1995,

(54) (a) Mary sent the schedules out to the shareholders.
    (b) Mary sent out the schedules to the shareholders.
    (c) I sent John up a drink.
    (d) ?I sent up John a drink.
    (e) *I sent John a drink up.

Here we find the particle interacting with a selected PP and the double object structure. Fortunately, the structures proposed here make fairly good predictions.

(55)

```
              initP
           ┌────┴────┐
         Mary        │
                 ┌────┴────┐
               init      procP
               send   ┌────┴────┐
                 the schedules  │
                            ┌────┴────┐
                          proc      resP
                        < send >  ┌───┴───┐
                             the schedules │
                                       ┌───┴───┐
                                     res       PP
                                     out    ┌───┴───┐
                                      the schedules │
                                                    P̄
                                                ┌───┴───┐
                                                P      PP
                                               to  the shareholders
```

(56)

```
           initP
        ┌────┴────┐
      Mary        │
             ┌─────┴─────┐
           init        procP
           send     ┌────┴────┐
                  proc       resP
                < send >  ┌───┴───┐
                        John      │
                              ┌────┴────┐
                            res        PP
                            up     ┌────┴────┐
                                 John        │
                                            P̄
                                       ┌─────┴─────┐
                                       P          DP
                                    $\emptyset_{poss}$   a drink
```

The particle in these cases doesn't actually shift, as we discussed above. In fact the word order differences result from the direct object either being spelled out in its most deeply embedded predicational subject position, or in its highest landing site position.

Summarizing, apparent result augmentation occurs in English under a number of different circumstances. English possesses a $\emptyset_{poss}$ head which is available with some verbs to license adjectival resultatives with no constraint on the semantic properties of the adjective at all, other than real world 'felicity'. Some process verbs in this section also seem to be able to identify [*init*, *proc*, *res*], and the latter structures therefore license pure PP locational resultatives. In addition, English possesses a wide range of 'intransitive' prepositions (particles) which are independently able to license *res*, giving rise to a wide variety of different abstract results, and to the phenomenon of particle shift. Alongside true result augmentation, I have also argued that path phrases in complement position to the *proc* are also expected in this system. These path phrases are subject to a homomorphism or matching requirement with respect to the process head, and if they represent paths which have an implicit final bound, they give rise to telicity. This class of items includes directional PP complements to process verbs and path-homomorphic gradable adjectives as complements of process verbs. Crucially, these 'telicity' effects do not arise from the presence of *res*P and their distributional properties are different.

5.5 Russian Lexical Prefixes

What I have tried to argue in the previous chapters is that an articulation of 'first phase syntax' allows a deeper understanding of the different verb classes and participant role types possible in natural language. In the next two sections, I pursue one important crosslinguistic consequence of the decompositional view: since verb meanings are compositional, there is no requirement (or indeed expectation) that 'first phase' predications be monomorphemic. The claim is that the order of projections proposed and their interpretation expresses a generalisation about articulation of events in natural language, and in particular predicts productive processes of result augmentation with great generality crosslinguistically, where their morphological consequences can be seen.

It has been long acknowledged in the Slavic linguistic tradition that prefixes are not all the same, but fall into a number of distinct classes. The broad classes that I will be concerned with here bear most resemblance to those of Isačenko

(1960), as discussed and modified by Forsyth (1970). The class that I am interested in here is the class of 'lexical prefixes' , which is opposed to the 'superlexical' ones (Smith 1995, Babko-Malaya 1999, Romanova 2006).

The 'lexical' prefixes in Russian are interesting because their meanings bear closest resemblance to their non-prefixal, or prepositional counterparts (especially with motion verbs). Most prefixes in Russian have a corresponding homophonous prepositional form, but, like particles in Germanic, they seem to double as small clause predicates in close conjunction with a verbal meaning ((cf. Kayne 1985, Guéron 1987 Hoekstra 1988, Svenonius 1994b, den Dikken 1995)). In other words, in many cases, the contribution of the prefix can be compositionally understood as bearing a predicational relation to the DP in object position.

(57)   v-bit'   knock in
        vy-tyanut'   pull out
        do-yti   go as far as
        za-vernut'   roll up
        s-letet'   fly down
        u-brat'   take away

(58) Boris vy-brosil sobaku
     Boris out-threw dog
     'Boris threw out the dog'

A small clause analysis of constructions of this type sees 'the dog' in (58) above as undergoing the throwing event, as well as being the subject or the 'figure' (cf. Talmy (1985), Svenonius (1994b)) of the small clause headed by the predicate 'out'. In other words, 'the dog' undergoes a 'throwing' and as a result becomes 'out'.

A detailed discussion of the effect of different lexical prefixes is beyond the scope of this monograph (Romanova 2006). It is important here to simply see the analytic similarity to the case of the Germanic particles. It is pervasively true of the lexical prefixes that they induce argument structure changes on the verb that they attach to. In (59) we see a case where an object is added with the addition of the prefix, and in (60), the semantic participancy of the object is radically changed by the addition of the prefix (the data here is taken from Romanova (2004b) and Romanova (2004a)).

(59) (a) v-rezat'   zamok   v dverj   * rezat'   zamok
            into-cut^P lock-ACC   in door-ACC   cut^I lock-ACC
            'insert a lock into a door.'

      (b) vy-bit'   glaz   * bit'   glaz
            out-beat^P eye-ACC   beat^I eye-ACC
            'hit an eye out.'

      (c) pro-gryzt'   dyru   * gryzt'   dyru
            through-gnaw^P hole-ACC   gnaw^I hole-ACC
            'gnaw a hole in something.'

(60) (a) Oni   stroili   garaži   na detskoj ploščadke.
           They-NOM   built-IMP/3PL garages-ACC on children's-LOC ground-LOC
           'They built garages on the the children's playground.'
      (b) Oni   zastroili detskuyu ploščadku   (garažami)
          They *za*-built children's playground-ACC (garages-INSTR)
          'They built the children's playground up (with garages)'

If we extend the analysis of the Verb-particle construction to the Russian lexical prefixes, we get a decomposition of the first phase in which the prefix occupies the *res* head in the structure. The 'object' of such a construction is simultaneously the RESULTEE and UNDERGOER of the decomposition. Thus, the representation of a Russian verb 'out-throw' in a sentence like (58) would be as in (61) below.

(61)

```
                    procP
                   /     \
                 DP      proc
                        /    \
                    proc      resP
                   throw     /    \
                           DP      res
                        the dog   /    \
                               res      PP
                               out     /   \
                                     DP     P̄
                                   the dog
```
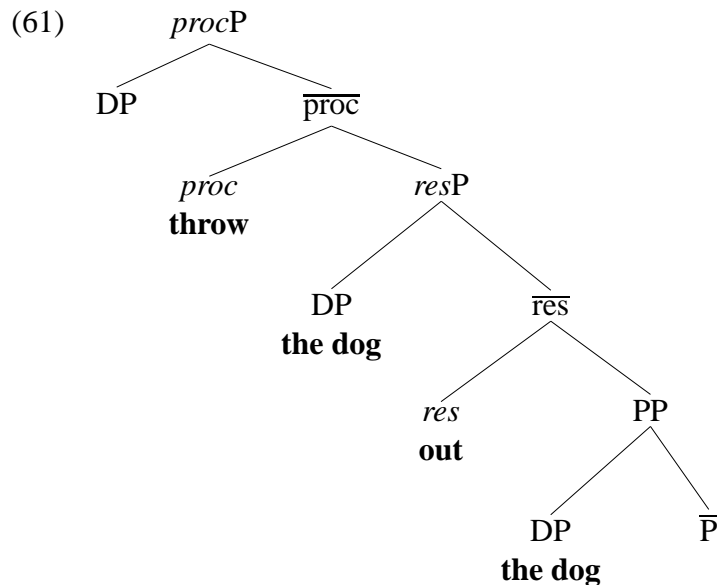
The only difference between the Russian case and the Verb-particle construction is that head-to-head movement (or its implementational analogue) combines the *res* head with the main verb, to give a prefixed morphological item.[5]

There are a variety of particular properties of lexical prefixes which mirror the behaviour of the particles in Germanic. These are laid out clearly in Svenonius 2004a, from which I repeat much of the following data. In particular, the verb plus prefix combination can function with a more abstract (less overtly spatial) interpretation of the P element to give a more abstract result, while still retaining the same predicational structure.

(62) (a) vy-sušit' — out-dry ('to dry up')
      (b) do-nesti — up-carry ('to report')

These particle combinations are systematically subject to idiosyncratic interpretations and co-occurrence restrictions, as are verb-particle combinations in Germanic.

(63) (a) vo-plotit' — in-flesh ('to realize (a plan)'
      (b) vy-dumat' — out-think ('to invent')
      (c) raz-jest' — around-eat ('to corrode')

Under the assumption that the lexical syntactic level (in my terms, the first phase) is a phase for the assignment of idiosyncratic encylopædic information (cf. Marantz 1997b), these facts are congruent with an account that places the prefix in a low position. The argument structure changing potential of these prefixes, the clear event structural decomposition possible for them, and the potential for idiomatisation, mark them out as elements of the first phase, event building phase.

As we might expect from the addition of a *res*P to the structure, lexically prefixed verbal forms in Russian are always incompatible with 'for an hour' adverbials, showing that they do contain *res*Ps in their first phase decomposition.

(64) Samoljot pere-letel   granicu (*čas)
      plane   across-flew border hour
      'The plane flew across the border.'

---

[5]As pointed out by Romanova 2006, these prefixes nearly always require a PP *in addition* to the prefix on the verb. In Romanova 2006 it is assumed that the prefix occupies the head in a higher shell of the PP structure (her little *p*), from where it moves to identify *res*. I will assume for simplicity here that the prefix is generated directly in *res*, since nothing about the present line of argumentation depends on this choice.

(65) Ona iz-lila   mne dušu (*čas)
     She out.of-poured me soul   hour
     'She poured out her soul to me.'   (Svenonius (2004))

Conversely, they *are* compatible with 'in an hour' adverbials, where the time frame adverbial indicates the time elapsed before the result state comes into being.

(66) Samoljot pere-letel   granicu za čas
     plane   across-flew border in an hour
     'The plane flew across the border in an hour.'

(67) Oni zastroili detskuyu ploščadku   (garažami)   za mesyats
     They *za*-built children's playground-ACC (garages-INSTR) in a month
     'They built the children's playground up (with garages) in a month'

While there are many more details and subtleties that remain to be investigated here, I will assume that the Russian lexical prefixes are an example of the same kind of decomposition that we see in the English verb-particle construction, the interest being that the very same structures can be constructed at the analytic word level or at the morphological level.

5.6 Completive Complex Predicates in Indic

Pursuing the resultative structure further into the crosslinguistic jungle, we find a systematic class of constructions in the Indo-Aryan language which are known as 'aspectual complex predicates' (Hook 1979, Butt 1995). These complex predicates consist of two verbs— a main verb and a 'light' verb. The main verb is in nonfinite form and seems to carry the rich lexical content of the predication; the 'light' verb is inflected for tense and agreement and contributes to the meaning of the whole in more abstract ways. The type of V-V complex predicate I will be concerned with here is the 'completive' complex predicate, illustrated below from Bengali (68).

(68) (a)ami   amṭa   kheye   phellam   *Bengali*
         I-NOM mango-CLASS. eaten-NONFINITE throw-PAST/1ST
         'I ate up the mango.'
     (b)ami   amṭa   khelam   *Bengali*
         I-NOM mango-CLASS. eaten-PAST/1ST
         'I ate the mango.'

(69) (a)ami   pathorṭa   thele   phellam
        I-NOM stone-CLASS. pushed-NONFINITE throw-PAST/1ST
        'I pushed (punctual) the stone/I gave the stone a push.'
     (a)ami   pathorṭa   thelam
        I-NOM stone-CLASS. pushed-PAST/1ST
        'I pushed the stone.'

In each case, the main verb, which occurs first in the linear order, is the contentful predicate. The difference between the complex predicates in (a) and the corresponding simple verb forms in (b) is that the latter are aspectually ambiguous between an accomplishment and an activity reading, whereas the versions with the light verb are obligatorily resultative. The following examples, show that the complex predicate version is incompatible with the Bengali equivalent of 'for an hour' and good with the 'in an hour' adverbial.

(70) Ram ektu khoner moddhe citti-dta lekhe phello   *Bengali*
     Ram in a short time   the letter write threw
     'Ram wrote the letter in a short time.'

(71) *Ram ektu khoner jonno citti-dta lekhe phello
     Ram in a short time   the letter write threw
     'Ram wrote the letter for a short time.'

Once again, despite the superficial differences between the Bengali construction and the Verb-particle construction in English, the two share some important properties: (i) the 'meaning' of the predicate is distributed over two parts; (ii) the light verb and the particle are each in their own way very bleached and abstract—meanings of simple motion, direction and transfer are used and are often strikingly parallel (compare Bengali light verbs 'rise', 'fall', 'give' 'take' with Germanic particles 'up' 'down', 'out', 'in'); (iii) the construction builds accomplishment meanings from more underspecified verbal forms.

The completive complex verbal construction is found throughout the Indo-Aryan languages with these same properties (Hook 1979). In Hindi/Urdu, it has been shown convincingly in Butt 1995 that the resultative light verb construction is monoclausal from the point of view of agreement, control and anaphora (see also Butt and Ramchand 2004. It is also true that the 'light' verb contributes to the argument structure of the whole, and changes the entailment properties of the arguments.

For example, in Hindi/Urdu, the choice of ergative case marking on the subject is determined by the light verb, not the main verb (cf. Butt 1995).

(72) usnee/*voo   xat   likh-aa   *Hindi/Urdu*
     Pron.Obl=Erg/Pron.Nom letter.M.Nom write-Perf.M.Sg
     'He wrote a letter.'

(73) *usnee/voo   xat   likh paṛ-aa
     Pron.Obl=Erg/Pron.Nom letter.M.Nom write fall-Perf.M.Sg
     'He fell to writing a letter.'

(74) us=nee/*voo   xat   likh lii-yaa
     Pron.Obl=Erg/Pron.Nom letter.M.Nom write take-Perf.M.Sg
     'He wrote a letter (completely).'

In some cases, the 'light' verb construction can even facilitate the addition of an unselected argument. In the examples below from Bengali and Hindi/Urdu, the light verb 'give' licenses the presence of a goal argument (75), (77), which would be impossible with the main verb alone (76), (78).

(75) ami   ram-ke   citthita lekhe   dilam   *Bengali*
     I-NOM ram-ACC letter   write-NONFIN give-PAST/1ST
     'I wrote up a letter for Ram.'

(76) *ami   ram-ke   cittita likhlam
     I-NOM ram-ACC letter write-PAST/1ST
     'I wrote a letter for Ram.'

(77) naadyaa-nee Saddaf-ko makaan   banaa dii-yaa   *Hindi/Urdu*
     Nadya.F=Erg Saddaf-Dat house.M.Nom make give-Perf.M.Sg
     'Nadya built a house (completely) for Saddaf.'

(78) *naadyaa-nee Saddaf-ko makaan   banaa-yaa
     Nadya.F=Erg Saddaf-Dat house.M.Nom make-Perf.M.Sg
     'Nadya built a house for Saddaf.'

Butt 1995 shows convincingly that the main verb and light verb in Hindi/Urdu demonstrate an integrity which is not found with biclausal constructions, or with genuine auxiliary verb constructions, showing that the complex behaves like a single lexical verb with respect to diagnostics like scrambling and reduplication (see also Butt and Ramchand 2004).

In the following Bengali examples, I show that the complex predicate exhibits integrity with respect to scrambling. In (79) we see that the direct object of a simplex predicate may scramble to initial position.

(79) (a)ami   meye-ke dekhlam   *Bengali*
        I-NOM girl-ACC see-PAST/1ST
        'I saw the girl.'
   (b)meye-ke ami   dekhlam
        girl-ACC I-NOM see-PAST/1ST
        'The girl, I saw (her).'

In the biclausal construction in (80) the whole nonfinite verb plus its own argument may scramble.

(80) (a)ami   bari-te jete   cai   na   *Bengali*
        I-NOM house-to go-NONFIN want-PRES/1ST not
        'I don't want to go home.'
   (b)bari-te jete   ami cai   na
        house-to go-NONFIN I-NOM want-PRES/1ST not
        'Going home, I don't want.'

However, in the completive complex predicate construction this is systematically impossible. The object *amṭa-*'mango' behaves like the direct object of the complex predicate as a whole and does not scramble together with its nonfinite verb. Adjacency between the two parts of the complex predicate cannot be disrupted by scrambling (81).

(81) ami   amṭa   kheye   phellam   *Bengali*
     I-NOM mango-CLASS. eaten-NONFINITE throw-PAST/1ST
     'I ate up the mango.'
   (b)*amṭa   kheye   ami phellam
     mango-CLASS. eaten-NONFINITE I -NOM throw-PAST/1ST

However, even though in both Bengali and Hindi/Urdu we find this evidence of predicational integrity, in neither case can this integrity be understood as word (X^0) formation. For example, in Bengali and Hindi/Urdu, the light verb can be separated from its main verb by topic fronting.

(82) **soo** too bacca   **ga-yaa**   *Hindi/Urdu*
    sleep Top child.M.Sg.Nom go-Perf.M.Sg
    'The child has gone to sleep.'

(83) **likh** too naadyaa xat-koo **l-ee-g-ii**
write Top Nadya.F.Nom letter.M=Acc take-3.Sg-Fut-F.Sg
'As for writing, Nadya will be able to write a letter.'

Thus, the very same paradoxes that arise with the Verb-particle construction in English and Scandinavian arise here as well: the complex form acts like a single unit with respect to aktionsart and argument structure, but is not a single lexical word. This opens up the possibility of an analysis in terms of a first phase decomposition as we have done for English, and again for Slavic above.

Bengali and Hindi/Urdu are descriptively SOV, and head-final more generally in all their projections. To extend the analysis to these languages, therefore, we predict that the process head should follow the result head (regardless of whether we chose to analyse this order in terms of base generation or movement). The predictions of the syntactic account are borne out. In our Indic resultative constructions, it is the first verb in the linear order that describes the final state achieved as a result of the event.

(84) Nadya-nee xat likh lii-yaa *Hindi/Urdu*
Pron.Obl=Erg/Pron.Nom letter.M.Nom write take-Perf.M.Sg
'He wrote a letter (completely).'

In (83) a process occurs instigated by Nadya, as a result of which a letter comes to be written. If we take the semantics seriously, 'written' must end up under the *res* head in the first phase syntax since it describes the final state. In a closely related language, Bengali, the morphology is clearer in that the first verb in the combination actually shows explicit perfect participle morphology (85), indicating the description of a result.

(85) Ruma cithi-ṭa **lekh-e** **phello** *Bengali*
Ruma letter-DEF write-PERFPART threw-3RDPAST
'Ruma wrote the letter completely.'

Note that analysing the first verb here as an *res* head is superficially at odds with the descriptive statement in the literature that the light verb in these constructions is what is responsible for adding the telicity (Hook 1979). However, the descriptive statement can easily be reconciled with the facts once we realise that it is the light verb that selects for an *res*P in this structure and thus in a way *is* responsible for the accomplishment reading, although the actual description of the final state achieved is the nonfinite verbal form. In fact, we can see that the

crucial contribution of the tensed verb here is as the process descriptor, since it is this head that selects the *res*P.

If the participle describes the final state achieved, then tensed verb must be responsible for instantiating the process head at least, and possibly the *init* head as well in the case of full transitive light verbs. This is not unusual in itself for a single lexical item to identify both *proc* and *init*, since under a decompositional account this is what main verbs do all the time. However, since the result of the process is given by the encyclopaedic content of the participle, this forces the cause-process component of the meaning to be fairly abstract— light verbs like 'take' , 'give' and 'go' found in this construction have fairly general meanings anyway.

The first phase decomposition of the sentence in (84), would therefore look as in (86) (assuming a head-final phrase structure for these languages).

(86)
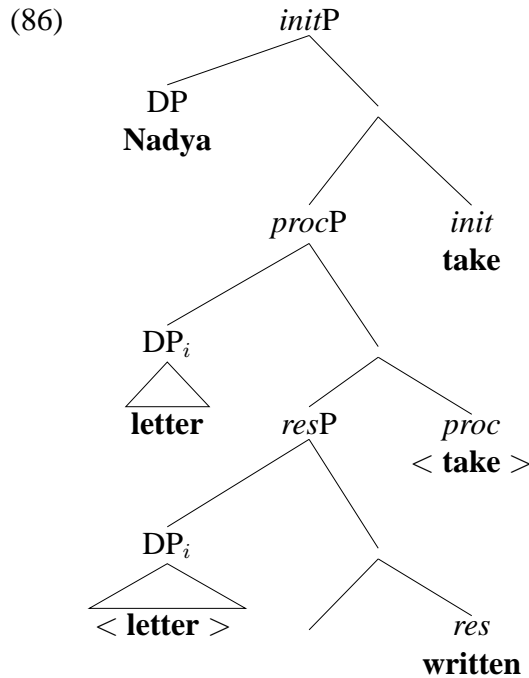
Under the view of compositional event roles outlined in the previous section, the internal argument must be base generated in Spec, *res*P since it is the holder of the resulting state, but a copy is also merged in the specifier of *proc*P, since it is the entity undergoing the change. The word order facts of the language also make it difficult to show exactly where the DP in question is spelled out, since in principle either location would be consistent with preverbal order. In general terms,

however, it is striking that the structure of the first phase syntax proposed makes exactly the right predictions for the order in which the subevents are instantiated, assuming head finality for this language.

This view of first phase syntax accounts for the predicational unity of the complex predicate as well as their resultative semantics ((i) and (ii) above). Thus, aspectual light verb constructions manifest the same components of first phase syntax (*init*, *proc*, *res*) as verb-particle constructions, but with different parts lexicalized:

The two language families are thus strikingly similar, but with a difference according to how rich the lexical encyclopaedic content of each part of the first phase syntax is. In the case of the verb-particle construction, the main verb provides the bulk of the real world content, and the particle representing the result is fairly abstract, or impoverished.

(87) Rich *proc*, Poor *res*:
John ate the apple up.

This is not logically necessary, however, as it can be argued that even in English, the converse case can be detected, whereby a 'light' verb joins forces with a richly contentful final state to create a complex predication.

(88) Rich *res*, Poor *proc*:
She got her boyfriend arrested.

In the descriptively head final languages Hindi/Urdu and Bengali, this is also the case: the 'light verb' is the *proc* element which is descriptively quite abstract and impoverished, while the *res* head, the non-finite perfective form, is full of encyclopaedic content.

(89) Poor *proc*, Rich *res*:
Ruma cithi-ṭa **lekh-e phello**.
Ruma the letter written threw

5.7 Conclusion

The purpose of this chapter has been to show that a theory that decomposes the simple verbal head to allow an embedded projection designated for resultant states makes good predictions for a variety of phenomena in natural language— namely

those that involve what Levin and Rappaport 1998 call 'result augmentation'. Result augmentation is a pervasive phenomenon crosslinguistically. The argument I have been making in this monograph is that its effects should be handled not in the lexicon, or in some distinct semantic module, but in the narrow syn-sem computation itself. Accounting for the data in this way gives a more restrictive grammar, and allows us to capture generalizations across languages and lexical items. The first phase decomposition allows us to see the commonality behind constructions such as the verb-particle construction, lexical prefixation in Russian and Bengali complex predicates, with the very same mechanisms that also allow us to compositionally integrate PPs and APs into structured events. Syntactically decomposing the first phase also avoids the paradoxes these 'joint predications' give rise to if a purely lexical approach were adopted. From the point of view of the first phase, it is initially misleading to look at English, since its verbal forms are very often multi-valued for category features and give rise to 'synthetic' lexical items. Under the view that I have been proposing, there is no deep difference between languages like English, Russian and Bengali other than the differences between 'synthetic', 'agglutinative' and 'analytic' choices for lexicalizing the projections within the first phase. In the next chapter, I turn to the other domain in which the decomposition proposed here should have clear morphological and syntactic effects — causativization.

Chapter 6

Causativization

6.1 Introduction

We have seen that causativization is one of the important factors underlying verb alternations in English, and one which I have argued is built in to the interpretation of verbal decompositional structure in a fundamental way. In this chapter, I look more closely at the morphology associated with causativization in one language, Hindi/Urdu, which productively constructs transitive verbs from simpler, usually intransitive bases. The argument here will be that in accounting for the regular morphology and its syntactic/semantic consequences, we can get some justification for the abstract system of primitives being argued for in this book. At the same time, the comparison between English and Hindi/Urdu will allow us to formulate some specific hypotheses about the nature of parametric variation in constructing verbal meaning. The larger picture will be, firstly, that there is explicit evidence for decomposition from morphological and analytical constructions, and secondly, that languages vary only in the 'size' of their lexical items, not in the fundamental building blocks of eventive meaning.

It is useful to begin with a discussion of the causative-inchoative alternation as found in English (and Romance) where a debate concerning the direction of lexical derivation has been active in the literature. Levin and Rappaport Hovav 1995 (henceforth L & R-H) distinguish between two types of intransitive verb: (i) those which embody *internal causation* and (ii) those which involve *external causation*. The externally caused verbs include *break* and *open* and other verbs that participate in the causative inchoative alternation in English. According to L & R-H, these verbs have essentially dyadic lexical templates, which under cer-

tain circumstances can be realised as monadic predicates in the syntax, expressing only the internal argument. The internally caused verbs include *laugh*, *run glow*, and *sparkle*. These have essentially monadic lexical templates and never appear as transitive predicates in the syntax (except under exceptional circumstances). Thus, L & R-H agree with Chierchia 2004 and Reinhart 2002 in deriving the causative-inchoative alternation from a fundamentally transitive frame. The process by which the dyadic template comes to be associated with monadic syntactic structure with a verb like *break* is a lexical 'binding' at a level that changes the argument structure. According to L & R-H, this process is available when the events can be conceptually conceived of as 'occurring spontaneously', when the root does not 'directly specify the nature of the causing event'. The argument for 'anti-causativization' in this sense is bolstered by the morphological evidence from languages like Romance where the inchoative version of a verb transparently contains the verb itself plus a piece of 'reflexivizing' morphology (e.g. *si* in Italian, *se* in French, *sja* in Russian). However, a typological study of the morphology associated with causative alternations shows that languages vary considerably in the direction of morphological complexity, with many languages showing a preference for causativizing as opposed to anticausativizing morphology. The strongly causativizing languages in this group include Indonesian, Japanese, Salish and all the languages of the Indian subcontinent, and many other languages show some causativizing morphology in at least a subset of their verb classes (see Haspelmath 1993).[1]. I will return to my particular interpretation of anti-causativizing morphology later on in this chapter, but for now I wish only to make the point that the argument from morphology is equivocal at best. The safest position from the point of view of morphology would be that the derivation can potentially go in either direction. L & R-H seem to believe that the anticausativization story is also compelling on conceptual and empirical grounds, although I will claim that those arguments go through only on a particular conception of the lexical module and its relation to syntax and semantics.

Levin and Rappaport-Hovav's central conceptual argument comes from certain patterns they find in the selectional restrictions on subjects and objects of alternating verbs. Specifically, they point out that in many cases the idiomatic

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[1]There is also a class of 'labile' or equipollent alternations, where either both verbal forms seem to be morphologically derived from the same root (language), or where no explicit morphology can be found on either alternant (English). These languages do not constitute a direct argument for anticausativization, and once they are removed from the picture the languages with anticausativizing morphology look like an interesting minority, rather than an argument for a universal principle of directionality.

interpretations of a verb that exist with special direct objects in the transitive version, are ungrammatical with those same objects expressed in subject position of the intransitive counterpart (1).

(1) (a) John broke his promise.
    (b) John broke the world record.
    (c) *His promise broke.
    (d) *The world record broke.

Because the range of semantically internal arguments is more constrained with the intransitive version than that found in the transitive, this is supposed to argue for a derivation in the direction of transitive to intransitive. There are, however, some cases that go in the opposite direction: in (2) the idiomatic interpretation is available in the intransitive but impossible in the transitive counterpart of the same verb.

(2) (a) The tent collapsed.
    (b) Mary collapsed.
    (c) Sue collapsed the tent.
    (d) *Sue collapsed Mary.

But even if the generalization that L & R-H appeal to is the dominant pattern, it is not clear that the argument goes through. The idea seems to be that any semantic content that is not predictable has to be listed together with the lexical item, and moreover that verbal meaning itself wholly resides in the lexical item. For the lexicalist, semantic content can easily be subtracted from a memorized specification via a straightforward rule; adding lexical content via a rule does not give a simple predictive system unless the added content is exactly the same for every alternation. Thus, idiosyncratic/idiomatic transitive versions are a problem for any additive rule that is supposed to generalize. However, once one accepts that idiom formation is not restricted to 'the word' or single lexical item, but can be associated with larger structures (cf. Marantz 1997a) as in the constructionalist framework generally, then this argument goes away. In other words, it is perfectly possible for an intransitive root to be built up further via a causational head into a transitive version, which then is associated via the encylopædia to a specific, idiomatic or conventionalized interpretation. Moreover, for the constructionalist, the intransitive to transitive derivation does not need to be stipulated as a rule at all, but is predicted as the outcome of structure building via a monotonic

derivation. Under a structure building system like the one defended more generally in this book, one actually expects transitivisation to be more regular and transparent than intransitivisation. It is not my purpose here to argue that the intransitive to transitive direction of derivation is the only conceptually attractive option, I mean only to deny the opposite claim. The claims of the conceptual and empirical superiority of the transitive-to-intransitive direction of derivation (as in Levin and Rappaport Hovav 1995, Reinhart 2002, Chierchia 2004) are based on a pre-judging of the issue in the form of certain very specific assumptions about the existence of the lexicon and its role in expressing selectional restrictions. We will come back to these issues in the final sections of this chapter.

I will tackle the more general theoretical problems surrounding causativization via a specific test case (Hindi/Urdu) where the morphology is clearly additive. The plot is to present an analysis of Hindi/Urdu causativization, and the difference between indirect and direct causation, in a framework that is syntactically decompositional, with no derivational processes operating in the lexicon. We will then return to English, to show that the architecture that works for Hindi/Urdu makes an alternative view of the English-type alternations more plausible. Thus, I will argue for exactly the opposite position from Levin and Rappaport-Hovav (1995): *break*-type verbs are basically monadic and can causativize because they embody no sense of causation in their intransitive version; *run*-type verbs contain both causational and processual components and therefore cannot add a distinct cause at the level of argument structure.

6.2   Overview of the Hindi/Urdu Causativization System

Nearly every verb in Hindi/Urdu can undergo morphological causativisation (Kachru 1980, Hook 1979, Masica 1991, Saksena 1982). Traditionally, these fall into three classes according to the nature of the morphology involved.[2] The first older stage of causativization in the language consists in a strengthening process applied to

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[2]In the data, the following conventions are used in the romanised transcription: vowel length is represented by doubling, Ṽ represents a nasalised vowel; Ç is a retroflex consonant; the Ch digraph represents an aspirated consonant. In the glosses the abbreviations used are: PROG = progressive, PERF = perfective, PASS= passive, F= feminine agreement, M= masculine agreement, SG= singular agreement, PL= plural agreement, PRES= present tense, PAST = past tense, NF= non-finite, ERG= ergative case, NOM= nominative case, INSTR= instrumental case, ACC= accusative case, DAT= dative case

the internal vowel of the root. This gives rise to a closed class of intransitive-transitive pairs in the language. The second two morphological devices are more productive and will be the focus of this chapter. They are: (i) the addition of the -*aa* suffix to the root; and (ii) the addition of the -*vaa* suffix to the root, representing direct and indirect causation respectively.

6.2.1   Transitive-Intransitive Pairs via Vowel Alternation

In this section, I briefly outline the facts concerning this class of alternations, since it is the primary source in the language for non-suffixed transitive verbs. An example of this alternation, taken from Bhatt 2003a is given below, as well as a list of alternating pairs from the same source.

(3) a.Jaayzaad bãṭ   rahii   hai
    property divide PROG-FEM be-PRES
    'The property is dividing.'
  b.Ram-ne   jaayzad bããṭ   dii
    Ram-ERG property divide give-PERF
    'Ram divided the property.'
  (from Bhatt (2003))

Intransitive	Transitive	Gloss
bãṭ-naa	bããṭ-naa	'be divided/divide'
bandh-naa	baandh-naa	'connect'
bigaṛ-naa	bigaaṛ-naa	'spoil'
bikhar-naa	bikher-naa	'scatter'
chhap-naa	chhaap-naa	'be printed/print'
chhid-naa	chhed-naa	'be pierced/pierce'
chhin-naa	chhĩĩn-naa	'be snatched/snatch'
ḍhal-naa	ḍhaal-naa	'shape/sculpt'
dhul-naa	dho-naa	'be washed/wash'

(4) | **Intransitive** | **Transitive** | **Gloss** |
|---|---|---|
| gir-naa | ger-naa | 'fall/cause to fall' |
| ghir-naa | gher-naa | 'be surrounded/surround' |
| juṛ-naa | joṛ-naa | 'be added/add' |
| kaṭ-naa | kaaṭ-naa | 'be cut/cut' |
| khĩch-naa | khĩĩch-naa | 'be pulled/pull' |
| khud-naa | khod-naa | 'be dug/dig' |
| khul-naa | khol-naa | 'open' |
| kuṭ-naa | kuuṭ-naa | 'be ground/grind' |
| lad-naa | laad-naa | 'be loaded/load' |
| luṭ-naa | luuṭ-naa | 'be robbed/rob' |
| mãj-naa | mããj-naa | 'be scoured/scour' |
| mar-naa | maar-naa | 'die/kill' |
| muṛ-naa | moṛ-naa | 'turn' |
| nichuṛ-naa | nichoṛ-naa | 'be squeezed/squeeze' |
| nikal-naa | nikaal-naa | 'come out/ bring out' |
| pal-naa | paal-naa | 'be brought up/ bring up' |
| pighal-naa | pighaal-naa | 'be pulverised/pulverise' |
| pis-naa | piis-naa | 'be hit/hit' |
| piṭ-naa | piiṭ-naa | 'be hit/hit' |
| ruk-naa | rok-naa | 'stop' |
| sĩk-naa | sẽk-naa | 'be heated/heat' |
| sudhar-naa | sudhaar-na | 'improve' |
| tan-naa | taan-naa | 'be taut/tighten' |
| tul-naa | tol-naa | 'weigh' |
| ṭal-naa | ṭaal-naa | 'be delayed/delay' |
| ṭan-naa | ṭaan-naa | 'hang' |
| ubal-naa | ubaal-naa | 'boil' |
| ukhaṛ-naa | ukhaaṛ-na | 'uproot' |
| ujar-naa | ujaar-na | 'be destroyed/destroy' |
| utar-naa | utaar-naa | 'get down/bring down' |

According to Paṇini and the ancient grammarians, causatives were formed
by root 'strengthening' (see Masica 1991 for a historical discussion). However,
sound changes have obscured the predictability of the strengthening rule, because
of a collapsing of vowel distinctions in the 'short' versions found in intransitives.
Saksena 1982 and Bhatt 2003a argue on the basis of predictability that the phono-
logical alternation must go in the direction of 'transitive → intransitive', suggest-

ing a synchronic anticausativization derivation. The vowel alternations in the root
are tabulated below.

aa → a
ii → i
uu → u
o → u
e → i

In addition, as Bhatt 2003a points out, there is a small group of verbs which has
the same form for both transitive and intransitive alternants. These always have
a short vowel, which by assumption cannot be further shortened by intransitivi-
sation. Once again, these pairs would simply have to be memorized, unless the
derivation was productive in the transitive to intransitive direction.

(5)	**Intransitive**	**Transitive**	**Gloss**
	badal-naa	badal-naa	'change'
	bhar-naa	bhar-naa	'fill'
	ghis-naa	ghis-naa	'rub'

Saksena 1982 further argues that there are some innovated intransitive forms in the
history of Hindi/Urdu, back-formed from certain transitives, where the historical
record does not support an original vowel strengthening process. On the other
hand, the alternation in the modern language does not appear to be particularly
productive, and the pairs remain part of a closed class. I will remain agnostic as to
whether there is a productive derivational process at work here, and concentrate
in what follows on the suffixal forms. In the discussions that follow, I will use
the term 'base transitive' for the transitive members of the pairs discussed in this
section (there are no other plausible candidates for 'base transitives' in Hindi/Urdu
other than the 'ingestives' which will be described in a later subsection.[3]

6.2.2   Causativization using the *-aa* suffix

Most roots in Hindi/Urdu are intransitive, and only become transitive (causativized)
by means of a suffix. We can see an example of this alternation in the following
pair of examples from Butt 2003. Note that the gloss in (6a) is forced into the

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[3]To reiterate, I do not intend to rule out the possibility of anticausativization in principle,
merely to make a case for productive processes of causativization in this language.

passive due to the lack of an intransitive version of 'build' in English. However, this form is clearly not a passive in Hindi/Urdu as diagnosed by the inability to take the equivalent of a 'by-phrase'.

(6) a.Makaan ban-aa
    house   make-PERF.M.SG
    'The house was built.'
  b. Anjum-ne   makaan ban-aa-yaa
     Anjum-ERG house   make-*aa*-PERF.M.SG
     'Anjum built a house.'
  (from Butt (2003))

A further list of some alternating forms is shown in the table in (7) below, taken from Bhatt 2003a, to give the reader some sense of the productivity and pervasiveness of the alternation.

(7)

Intransitive	Transitive	Gloss
bach-naa	bach-aa-naa	'be saved/save'
bah-naa	bah-aa-naa	'flow/cause to flow'
bahal-naa	bahl-aa-naa	'be entertained/entertain'
baiṭh-naa	biṭh-aa-naa	'sit/seat'
ban-naa	ban-aa-naa	'be made/make'
baṛh-naa	baṛh-aa-naa	'increase'
bhaag-naa	bhag-aa-naa	'run away/chase away'
bhiig-naa	bhig-aa-naa	'become wet/wet'
bichh-naa	bichh-aa-naa	'unroll'
biit-naa	bit-aa-naa	'elapse/cause to elapse'
bikhar-naa	bikhr-aa-naa	'scatter'
bujh-naa	bujh-aa-naa	'go/put out'

chamak-naa	chamk-aa-naa	'shine'
caṛh-naa	caṛh-aa-naa	'climb/cause to climb'
chipak-naa	chipk-aa-naa	'stick'
chÕk-naa	chÕk-aa-naa	'be startled/startle'
chhip-naa	chhip-aa-naa	'hide'
ḍar-naa	ḍar-aa-naa	'fear/scare'
ḍuub-naa	ḍub-aa-naa	'drown'
gal-naa	gal-aa-naa	'melt'
gir-naa	gir-aa-naa	'fall/cause to fall'
hil-naa	hil-aa-naa	'rock'
jaag-naa	jag-aa-naa	'wake up'
jam-naa	jam-aa-naa	'freeze'
jii-naa	jil-aa-naa	'be alive/cause to be alive'
lag-naa	lag-aa-naa	'be planted/attach'
leṭ-naa	liṭ-aa-naa	'lie/lay'
mil-naa	mil-aa-naa	'meet/introduce'
miṭ-naa	miṭ-aa-naa	'be wiped/wipe'
pahũch-naa	pahũch-aa-naa	'arrive/escort'
pak-naa	pak-aa-naa	'ripen'
phail-naa	phail-aa-naa	'spread'
pighal-naa	pighl-aa-naa	'melt'
ro-naa	rul-aa-naa	'cry/cause to cry'
saj-naa	saj-aa-naa	'be decorated/decorate'
saṛ-naa	sa̤-aa-naa	'rot'
so-naa	sul-aa-naa	'sleep/put to bed'
sulag-naa	sulg-aa-naa	'be lit/light'
sulajh-naa	suljh-aa-naa	'get simplified/simplify'
suukh-naa	sukh-aa-naa	'dry'
uṭh-naa	uṭh-aa-naa	'rise/raise'

One important thing to notice about the addition of the *-aa* suffix is that it triggers vowel shortening in the root that it attaches to, according to the same pattern of root vowel alternations seen in the transitive-intransitive pairs above. However, in this case, because it is triggered by the addition of the suffix, it is the transitive version that ends up with the shortened root vowel.

It has been claimed in the literature that 'direct' or 'lexical' causatives tend to apply only to unaccusatives, and not to unergatives or to base transitives. How-

ever, this is not the case for *-aa* suffixation in Hindi/Urdu, since all intransitives undergo the process and some of them do indeed pass the tests of unergativity in the language. According to Bhatt 2003a, intransitives fall into two classes with regard to the following tests.

Diagnostics for Unaccusativity
(i) The past participle of unaccusatives can be used in a reduced relative, unergatives not.
(ii) Unaccusatives can never form impersonal passives, while unergatives can.
(i) Only unaccusatives form an inabilitative construction, unergatives (and transitives) require passive morphology to do so.

(8) *Unergative in Reduced Relative*
    *hãs-aa   (huaa)   laṛkaa
    laugh-PERF be-PERF boy
    *'the laughed boy'

(9) *Unaccusative in Reduced Relative*
    kaṭ-e   (hue)   phal
    cut-PERF be-PERF.M.PL fruit
    'the cut fruit'

(10) *Impersonal Passive of Unergative*
    calo   dauṛ-aa jaaye
    come on run-PERF PASS
    'Come on, let it be run (let us run)'

(11) *Passive of Unaccusative*
    *calo   kaṭ-aa jaaye
    come on cut-PERF PASS

In the inabilitative construction, the instrumental marked argument is interpreted as the participant that a particular (in)ability is predicated of. For transitives and unergatives, the construction uses the same verbal complex form as the analytic passive (12) and (13) respectively; for unaccusatives no passive morphology is required to get the reading (14). This is thus another clear test that distinguishes

unaccusative intransitives from unergative intransitives. (The test and the data here are taken from Bhatt 2003a).[4]

(12) **Inabilitative based on Passive of Transitive**
Nina-se   dhabbe mitaa-ye   nahĩı gaye
Nina-INSTR stains.M wipe-PERF.PL neg   PASS-PERF.MPL
'Nina couldn't (bring herself to) wipe away the stains.'

(13) **Inabilitative based on Passive of Unergative**
Nina-se   daur-aa   nahĩı gayaa
Nina-INSTR run-PERF neg   PASS-PERF
'Nina couldn't run.'

(14) **Inabilitative based on Active of Unaccusative**
Nina-se   dhabbe nahĩı mit-e
Nina-INSTR stains.M neg   wipe$_{intr}$ -PERF.MPL
'Nina wasn't able to wipe away the stains.'

Examples of intransitives in Hindi/Urdu that, according in Bhatt 2003a, satisfy the unergativity diagnostics are shown below, together with their 'causativized' alternants.

(15) | **Intransitive** | **Transitive** | **Gloss** |
| --- | --- | --- |
| chal-naa | chal-aa-naa | 'move, walk/cause to move, drive' |
| daur-naa | daur-aa-naa | 'run/cause to run, chase' |
| hãs-naa | hãs-aa-naa | 'laugh/cause to laugh' |
| naach-naa | nach-aa-naa | 'dance/cause to dance' |
| ur-naa | ur-aa-naa | 'fly' |

While these verbs pattern as unergatives with respect to the tests, it is not clear whether the initiational interpretation on the original subject is actually retained when the verb is transitivized using the *-aa* suffix. In fact, the selectional restrictions on the object of these transitives seem to require a participant that is inanimate, or explicitly controllable (17) (data from Bhatt 2003a).

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[4]The inabilitative reading is facilitated by the presence of negation, and by the imperfective aspect. The instrumental marked argument is preferentially initial (unlike in the corresponding 'passive'), and has subject properties (see Bhatt 2003b and Butt 2003 for details). An actual analysis of this construction is beyond the scope of this paper, however.

(16) patang/chiṛiyaa uṛ rahii   hai
     kite/bird   fly PROG.F be-PRES.SG
     'The kite/the bird is flying.'

(17) Anjali patang/*?chiṛiyaa uṛaa rahii   hai
     Anjali kite/bird   fly PROG.F be-PRES.SG
     'Anjali is flying a kite/* a bird.'

Causativisation of 'Basic' Transitives

In addition to being able to attach to basic unergatives, the *-aa* suffix also appears to attach to the transitives found in the vowel alternating class discussed at the outset. In principle, it is quite difficult to tell whether the *-aa* suffix is attaching to the transitive or the intransitive alternant because vowel shortening obscures the length of the root vowel. In addition, the *-aa* suffixed form has an extra required argument when compared to the base intransitive *kaṭ* , but does not add another argument when compared to the transitive *kaaṭ*. Thus, it is not clear whether the alternation is as shown in (18), or as shown in (19) (data from Butt 1998).

(18) (a) Paoda kaṭ-aa
         plant cut-PERF.M.SG
         'The plant got cut.'
     (b) Anjum-ne   paoda kaṭ-aa-yaa
         Anjum-ERG plant cut-*aa*-yaa
         'Anjum cut a/the plant.'

(19) (a) Anjum-ne   paoda kaaṭ-a
         Anjum-ERG plant cut-PERF.M.SG
         'Anjum cut a/the plant.'
     (b) Anjum-ne   (saddaf-se)   paoda kaṭ-aa-yaa
         Anjum-ERG saddaf-INSTR plant cut-*aa*-yaa
         'Anjum had Saddaf cut a/the plant.'

However, in (19), we can see that the *-aa* suffixed version allows an instrumental adjunct interpreted as an intermediate agent, something not allowed in the base transitive version.[5]

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[5]An instrumental-marked adjunct is in fact also allowed in the base transitive, but is interpreted as an instrumental, and cannot be used on an intermediate 'agent'.

Causativisation of Transitive 'Ingestives'

With one small class of transitive verbs, causativization with *-aa* is possible with the *addition* of a required argument, to create a derived 'ditransitive'. The following table is taken from Bhatt 2003a.

(20)	**Verb**	**Verb-aa**	**Gloss**
	chakh-naa	chakh-aa-naa	'taste/cause to taste'
	dekh-naa	dikh(l)-aa-naa	'see/show'
	khaa-naa	khil-aa-naa	'eat/feed'
	pakaṛ-naa	pakṛ-aa-naa	'hold, catch/hand, cause to hold'
	paṛh-naa	paṛh-aa-naa	'read/teach'
	pii-naa	pil-aa-naa	'drink/cause to drink'
	samajh-naa	samjh-aa-naa	'understand/explain'
	siikh-naa	sikh-aa-naa	'learn/teach'
	sun-aa	sun-aa-naa	'hear/tell'

As can be seen in the pair of examples below (from Butt 1998), an extra *-ko* (dative) marked argument becomes obligatory with the suffixed form of the root. This argument can be seen as the 'demoted' subject of the base transitive version (21), but it also gets the semantics of an 'affected' argument (cf. Alsina 1992). Note that this argument is obligatory, and cannot be expressed with the instrumental *-se* morphology classically associated with unexpressed agents of causatives.

(21) Saddaf-ne   khaanaa kha-yaa
    Saddaf-ERG food   eat-PERF.M.SG
    'Saddaf ate food.'

(22) Anjum-ne   Saddaf-ko/*se   khaanaa khil-aa-yaa
    Anjum-ERG Saddaf-ACC/*INSTR food   eat-*aa*-PERF.M.SG
    'Anjum fed Saddaf food.'

Bhatt and Anagnostopoulou 1996 show that examples such as (22) above behave in many subtle respects like base ditransitives such as 'give' in the language, showing the same internal syntax.[6] Interestingly, the paraphrases of these forms

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[6]For example, the *-ko* here is a real dative and cannot be dropped under conditions of animacy (unlike the homophonous accusative); there is obligatory object shift when the object is marked with overt accusative case.

in English reflect their special semantics— a form such as (22) does not mean 'Anjum caused Saddaf to eat food', it must mean that 'Anjum *fed* Saddaf, directly affecting her in doing so.'.

6.2.3   Causativization using the *-vaa* Suffix

One of the striking things about causativization in *-vaa* is that it does not show any obvious differences in distribution as compared to the *-aa* class. On the other hand, the *-vaa* causative is traditionally considered to be the 'indirect' causation marker, interpreted by Kachru 1980 as a 'second' causative, and by Shibatani 1973a, Shibatani 1973b as a 'syntactic' causative alongside a more 'lexical', 'first causative' *-aa*. If we consider the triple of examples in (23) -(25), it is easy to find this representation of the facts tempting.

(23) a. makaan ban-aa
　　　　house   be made-PERF.M.SG
　　　　'The house was built.'
　　 b. anjum-ne   makaan ban-aa-yaa
　　　　anjum-ERG house   be made-*aa*-PERF.M.SG
　　　　'Anjum built a house.'
　　 c. anjum-ne   (mazdurõ-se)   makaan ban-vaa-yaa
　　　　anjum-ERG labourers-INSTR house   be made-*vaa*-PERF.M.SG
　　　　'Anjum had a house built by the labourers.'
　　 (from Butt 2003)

However, once one looks at the data more closely, there are compelling reasons to reject this kind of account. The first embarassment for the idea that *-vaa* causatives are 2nd causatives of *-aa* forms is the fact that the morphemes themselves do not stack, although they are both extremely regular and productive. One could of course postulate a productive deletion rule, but that would have no *independent* justification. Moreover, it would fail to make sense of the fact that the *-vaa* suffix already seems to contain the *-aa* suffix as a subcomponent, but on the wrong side of the root. In other words, if these morphological elements are to combine by any straightforward process respecting the mirror principle, which would expect the *-aa* to be embedded within *-v* suffixation.

Secondly, there are many cases where *-aa* suffixation and *-vaa* suffixation can both be applied, producing forms that seem virtually synonymous, and where both forms allow the addition of an instrumental *-se* marked intermediate agent.

This happens when suffixation applies to roots with transitive meanings, like *kaaṭ-* 'cut', (seen above in the discussion of *-aa* causativization). Parallel causatives in *-aa* and *-vaa* are shown here in (24) below.

(24) (a) maĩ-ne naukar-se   per kaṭ-aa-yaa
       I-ERG servant-INSTR tree cut-*aa*-PERF
       'I had the servant cut the tree.'
   (b) maĩ-ne naukar-se   per kaṭ-vaa-yaa
       I-ERG servant-INSTR tree cut-*vaa*-PERF
       'I had the servant cut the tree.'
(from Saksena 1982)

Once again, it is difficult to tell whether the *-vaa* suffix is attaching to the transitive or to the intransitive stem, because of vowel shortening. However, Bhatt (2003) points out some consonant changing idiosyncrasies which seem to indicate that, at least in some cases it must be the transitive stem that is being used.

(25)	**Intransitive**	**Transitive**	**-vaa Causative**	**gloss**
	chhuuṭ-naa	chhoṛ-naa	chhuṛ-vaa-naa	'be free/free'
	phaṭ	phaaṛ-naa	phaṛ-vaa-naa	'be torn/tear'
	phuuṭ-naa	phoṛ-naa	phuṛ-vaa-naa	'be burst/burst'
	ṭuuṭ-naa	toṛ-naa	tuṛ-vaa-naa	'break'

In general, then, *-vaa* and *-aa* attach to what appears to be the very same root/stem, with both transitives and intransitives of both kinds combining with both suffixes.

(26)	**Base unaccusative**	*ban*	*ban-aa*	*ban-vaa*
		'get made'	'make'	'have s.t. made'
	Base unergative	*hãs*	*hãs-aa*	*hãs-vaa*
		'laugh'	'make laugh'	'have (s.o.) laugh'
	Base 'ingestive'	*paṛh*	*paṛh-aa*	*paṛh-vaa*
		'read'	'teach'	'have s.o. study'
	Base transitive	*kaaṭ*	*kaaṭ-aa*	*kaaṭ-vaa*
		'cut s.t.'	'have (s.o.) cut s.t.'	'have (s.o.) cut s.t.'

The special class of 'ingestives' should also be considered here. Here, once again, the *-vaa* morpheme never creates more obligatory arguments than the *-aa* morpheme. The difference here is that (as in the base unaccusatives), the *-vaa* morpheme makes an instrumental intermediate agent possible, where the *-aa* form does not.

(27) a. rita-ne   angur khaa-e
         rita-ERG grape eat-PERF.M.PL
         'Rita ate some grapes'
     b. rita-ne   sima-ko   angur khil-aa-e
         rita-ERG sima-DAT grape eat-*aa*-PERF.M.PL
         Rita fed Sima some grapes.'
     c. kala-ne   (rita-se)   sima-ko angur   khil-vaa-e
         Kala-ERG (rita-INSTR) sita-DAT eat--*vaa*-PERF.M.PL
         'Kala made Sima eat some grapes (through the agency of Rita). '
     (from Butt 2003)

Thus, even though there are meaning differences between *-aa* causativization and *-vaa* causativization which might lead one to believe that the latter was the 'second causative' of the former, a closer look at the distribution shows that both suffixes attach to exactly the same root forms, and have exactly the same number of obligatory arguments when they do so. Semantically, there is a pervasive difference with respect to whether the causation is interpreted as 'direct' or 'indirect' (using these terms intuitively for the moment), which is related to the fact that an optional instrumental case-marked participant is interpreted as an instrument in the case of *-aa* causativization of intransitives, but as an intermediate agent in the case of *-vaa* causativization with the same roots.

Perhaps most devastating for the inner vs. outer causative analysis of *-aa* and *-vaa* is the fact that the *-vaa* form does not necessarily entail the truth of the *-aa* form. This can be seen most clearly in the examples involving ingestive verbs. As pointed out by Saksena 1982, the *-vaa* causative form in the (a) examples below does not entail the truth of the *-aa* causative in the (b) examples.

(28) (a) mai-nee laṛkee-koo   doo bajee   khil-vaa-yaa
         I-ERG   boy-ACC/DAT two o'clock eat-vaa-PAST
         'I had the boy eat at two o'clock.'
     (b) kisii-nee laṛkee-koo   doo bajee   khil-aa-yaa
         someone boy-ACC/DAT two o'clock eat-aa-PAST
         'Someone fed the boy at two o'clock.'

(29) a. mãĩ-ne laṛke-ko paṛh-vaa-yaa
     I-ERG boy-DAT study-IT-PERF.M
     'I had the boy study.'
  b. mãĩ-ne laṛke-ko paṛh-aa-yaa
     I-ERG boy-DAT study-IT-PERF.M
     'I taught the boy.'
  (from Saksena 1982)

From the point of view of productivity and idiosyncrasy, the *-aa* and *-vaa* morphemes also cannot be distinguished. They are both equally morphologically regular: they show no allomorphy and determine no stem allomorphy; both suffixes shorten the vowel in the stem when they attach; they both attach to any type of root.[7] As far as lexical idiosyncrasy is concerned, both forms seem to give regular and predictable meanings in the general case. However, there do exist a number of lexically idiosyncratic forms and selectional restrictions, for *both* types (data from Saksena 1982).

(30) **Root (intr)**   **Idiomatic Transitive**

bul-naa	'speak'	*bul-aa-naa*	'call someone'
pak-naa	'ripen'	*pak-aa-naa*	'cook'
paṭ-naa	'get along'	*paṭ-vaa-naa*	'lay a floor/roof'
le-naa	'take'	*li-vaa-naa*	'buy something for someone'

6.2.4   Status of the Causee

As we have seen, under certain conditions, a *-se* marked (instrumental) adjunct is licensed in Hindi/Urdu causatives, interpreted as an intermediate agent or 'causee'. This never seems to be possible with base intransitives and base (unsuffixed) transitives. However, the possibility of a causee does not cleanly distinguish the *-aa* forms from the *-vaa* forms in all cases. When it attaches to an intransitive root, *-aa* suffixation does not seem to license the presence of an instrumental marked causee, while the *-vaa* form does.

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[7]There are some transitives that do not have *-aa* causatives, and some that do not seem to have *-vaa* causatives, but no real pattern for this has been discerned in the literature. Many transitives in fact have both versions, although speakers claim that they are virtually synonymous.

(31) a.Makaan ban-aa
       house   make-PERF.M.SG
       'The house was built.'
    b. Anjum-ne   (*mazduõ-se)   makaan ban-aa-yaa
       Anjum-ERG (*labourers-INSTR) house   make-*aa*-PERF.M.SG
       'Anjum built a house.'
    c. Anjum-ne   (mazduõ-se) makaan   ban-vaa-yaa
       Anjum-ERG house   make-*vaa*-PERF.M.SG
       'Anjum had a house built (by the labourers).'

Similarly, with the ingestives, an instrumental marked causee is possible with the -*vaa* causative version, but not with the -*aa* causative version. The 'direct object' is not really a causee in (32) in the same sense, but a dative affected argument, and this argument is also obligatory with -*vaa*.[8]

(32) a.Saddaf-ne   khaanaa kha-yaa
       Saddaf-ERG food   eat-PERF.M.SG
       'Saddaf ate food.'
    b. Anjum-ne   (*Ram-se) Saddaf-ko   khaanaa khil-aa-yaa
       Anjum-ERG Ram-INSTR Saddaf-ACC food   eat-*aa*-PERF.M.SG
       'Anjum fed Saddaf food (*through the intermediary of Ram).'
    c. Anjum-ne   (Ram-se)   Saddaf-ko   khaanaa khil-vaa-yaa
       Anjum-ERG Ram-INSTR Saddaf-ACC food   eat-*vaa*-PERF.M.SG
       'Anjum had Saddaf eat food through the intermediary of Ram.'
    from Butt 1998)

However, with many transitive roots, both -*aa* and -*vaa* allow a -*se* marked causee, when they both exist.

(33) Anjum-ne   paoda kaaṭ-a
    Anjum-ERG plant cut-PERF.M.SG
    'Anjum cut a/the plant.'

(34) Anjum-ne   saddaf-se   paoda kaṭ-aa-yaa
    Anjum-ERG saddaf-INSTR plant cut-*aa*-yaa
    'Anjum had Saddaf cut a/the plant.'

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[8]The strange case of cakh-'taste'.

(35) Anjum-ne   saddaf-se   paoda kaṭ-vaa-yaa
     Anjum-ERG saddaf-INSTR plant cut-*aa*-yaa
     'Anjum had Saddaf cut a/the plant.'

To summarize, causees, in the sense of being instrumental (*-se*) case-marked nominals interpreted as an 'intermediate agent' have the following properties: they are always optional; with *-vaa* causatives they are always possible; with *-aa* causatives they are possible only when the base is a (non-ingestive) transitive; they are never possible with the base transitives formed via vowel alternation. It is important to note that instrumental marked adjuncts are actually nearly always possible with all verbal forms (interpreted as instruments), it is just their interpretation as intermediate agents that is at stake here.

6.2.5 Status of Causer

There is also a difference between the two types of causative with respect to the nature of the surface subject, or causer, although this has not been pointed out in the literature before as far as I am aware. It is true that English allows a much wider range of subjects/causers than most other languages, and Hindi/Urdu is no exception. However, the informants I consulted all accepted a certain limited number of stative and abstract causes in subject position. Strikingly, these were only possible with the causatives in *-aa*. Causatives in *-vaa* seemed only to be possible when the subject was an active instigator. Some causative pairs are shown below. In each case, both the *-aa* and *-vaa* causative were used in common natural speech by my informants, and in each case only the *-aa* causative was possible with that particular choice of subject.

(36) (a) *ban-aa-naa/*ban-vaa-naa* — 'John's money built that house.'
     (b) *pak-aa-naa/*pak-vaa-naa*— 'The sun ripened the fruit.'
     (c) *suljh-aa-naa/*suljh-vaa-naa*— 'The new arrangements simplified the problem'
     (d) *ubalaa-naa/*ubal-vaa-naa* — 'The kettle boiled the water very fast.'
     (e) *dhul-aa-naa/*dhul-vaa-naa* — 'The rain washed the clothes'

6.2.6 Summary

So far, I have been at pains to describe the morphological system of a language that productively derives causative/transitive verbs. . A cursory examination of the

world's languages will show many such cases. The point however, is not merely to establish that there is a piece of morphology that is a plausible candidate for the initiation head in the first phase decomposition argued for in this monograph. Nor even that it is also on the 'correct' side of the root, if it is to represent a morpheme in a structurally higher position than the root (consistent with the expectations of a Kaynian head-initial structure and the mirror principle). A typological examination of the world's languages (Julien 2000, shows that productive causative morphology when it exists indeed occurs closer to the root than tense or modality inflection. This supports a structural position for causation that is at least lower than tense, and higher than the root. Furthermore, the fact that this morphology also affects the argument-taking properties of the predication, argues for the causational head being somehow inside the 'first phase', or the domain often referred to as the *v*P. But so far, the facts are entirely consistent with many different implementations of the causative *v* head structures proposed by many recent researchers (Pylkkänen 1999, Kratzer 1996, Harley 2000) and flavours thereof.

A more specific understanding of the processes involved is not possible from the evidence of morphological typology— a more detailed case study is required as offered here. Hindi/Urdu is an important test case because it is a language that shows highly regular and productive morphological exponence of causation, and has been reported to show the classic distinction between 'direct' and 'indirect' causation. This latter feature relates to the issue of 'recursion' of causational semantics, and to traditional claims about the lexical/syntactic dichotomy.

There are a number questions any successful analysis of the Hindi/Urdu patterns should resolve. First and most basically, we need to understand the placement and productivity of these suffixes in attaching to roots that can be unergative and transitive in addition to unaccusative. Related to this, there is the question of why the 'ingestive' class of transitive roots is distinguished in actually giving rise to ditransitive causative structures. Secondly, if we are to take the order and productivity of morphemes seriously, is it possible to make sense of the fact that the *v* of the indirect causative is actually closer to the root than the *aa* piece of the morphology that the direct and indirect causatives share? Lastly, given that both suffixes seem to attach to the same roots, and have the same possibilities with regard to productivity on the one hand and lexical idiosyncrasy on the other, how can one make sense of the semantic differences between direct and indirect causation that have been noticed in the literature? In constructing an analysis that answers these questions, we can be more concrete about the details of lexical 'insertion' than our analysis of English alone could allow. The goal is to arrive at a theory of causativization that can then be generalized both to languages with

'synthetic' lexical items like many English verbs, and those with more analytic systems.

6.3 Analysis

6.3.1 Representing the Verb Classes in Hindi/Urdu

With these principles in hand, we must next establish the first phase representations of the individual root types in the language. We have seen that there are at least four broad classes of roots, based on certain robust language internal diagnostics and distribution. We must first distinguish between the two different types of intransitive, designated informally by the labels 'unaccusative' vs. 'unergative'. The former type of intransitive can be used in reduced relatives, as we saw, while the latter cannot. In addition, the 'unergative' roots can undergo impersonal passivization, unlike the 'unaccusatives'. Although most transitive verbs are formed using the *-aa* and *-vaa* suffixes, there is, as I have been assuming, a class of base 'transitive' roots. These are the transitives that form pairs with intransitives by means of (unproductive) vowel alternation. These transitives are like the 'unergative' intransitives in that they passivize, and they require passivization in the inabilitative construction. I will therefore assume that what transitives and unergatives have in common is that they both have *init* features in their representation, thus licensing INITIATOR arguments.

On the other hand, the patterns of causativization in the language seem to be sensitive to a slightly different distinction, carving the verb types up a little differently. Basically, with respect to causativization, all intransitives pattern together, and together with the small class of transitive 'ingestives' in opposition to the core transitives. With the former class, the subject of the original verb becomes a direct structurally case marked argument under (both types of) causativization. While with the latter class, the subject of the original verb does not appear at all, or appears as an optional instrumental adjunct. Another way of putting the generalization is to say that intransitives and ingestives increase their valency under causativization with *-aa* or *-vaa*, while transitives show no such valency increase (although allowing a 'causee' adjunct). I will interpret this pattern as meaning that the subject argument of the verbs that increase in valency is actually an UNDERGOER, and that this is what allows is to appear as the object argument of the causativized version. Notice that this means that both unergatives and ingestive transitives must have UNDERGOER-INITITATOR subjects, a possibility we saw al-

ready with motion verbs in English. Another way in which the 'ingestive' class
appears to be similar to the intransitives is that they systematically allow unspeci-
fied object deletion (Saksena 1982) and are often thus used 'intransitively'. I will
assume that this is because the 'object' argument of an ingestive is actually a PATH
argument, whose content can be recovered from context.

To summarize, the basic verb root classes we find in Hindi/Urdu will be anal-
ysed as follows:

Verb Classes in Hindi/Urdu:
Unergatives (including intransitive motion verbs): single argument; INITIATOR-
UNDERGOER
Unaccusatives: single argument; UNDERGOER-RESULTEE
Transitives: two arguments; INITIATOR and UNDERGOER
Ingestives: two arguments; INITIATOR-UNDERGOER and PATH/RHEME.

6.3.2   Direct vs. Indirect Causation

The second step towards an analysis is to come up with an analysis of direct vs.
indirect causation that does not involve actual recursion of the causative head. The
reason that recursion seems wrong for Hindi/Urdu is that, as we have seen, there is
no actual direct morphological recursion in evidence, and no productive semantic
recursion (although as we saw, there are some pairs that could be interpreted that
way). In addition, there is no evidence that the 'indirect' causative *-vaa* is 'outside'
or more syntactic than the *-aa* causative: they are both equally morphologically
productive, attach to the same types of roots, and each have their own limited
degree of lexical idiosyncrasy.

Fortunately, there is another potential way to capture the semantics of indirect
causation without recursion of the *init* head in the first phase. To do so, we ex-
ploit the idea that causation more generally actually obtains between each pair of
subevents in the first phase decomposition— between the initiation and process,
as well as between the process and result, if any.

As noted in the previous chapter on resultative formation, Levin and Rappaport-
Hovav (1999) proposed a distinction between two types of resultative construc-
tion, into a kind of direct vs. indirect result that plays a role here. In their case,
they correlate the idea of 'direct-ness' with a kind of temporal dependence be-
tween the two relevant subevents, calling only the 'indirect' or temporally inde-
pendent subevents causational.

- A causative event structure consisting of two subevents formed from the conflation of temporally-independent events

- A simple event structure formed from the conflation of two temporally-dependent "coidentified" events.

In the terms of this monograph, the relation between the *init* subevent and the *proc* subevent is one of causation, as is the relation between the *proc* subevent and the *res* one. In understanding the various types of resultative formation, I proposed a relationship between subevents that was geared to which morpholexical items identified which head in the first phase decomposition. This temporal dependence hypothesis is repeated here in (37).

(37) *Temporal Dependence Hypothesis*:
   For a result subevent to be temporally dependent on a process, the same root must identify the two subevents.

This claim is relevant to any analysis of indirect causation, because the semantics of indirect causation is correlated with the potential lack of temporal dependence between subevents. It allows us to get the *effects* of embedding one cause within another cause without actually doing so: the idea will be that the subevents are asserted to be causally related while being temporally and lexically distinct, giving rise to the *inference* of an intermediary. Thus, I will claim in what follows that indirect causation does not involve recursion of the *init* head, but occurs whenever the morpheme identifying the *proc* head is lexically distinct from the morpheme lexically identifying *res*.

For ease of reference I also repeat the constraints on event composition I proposed in the previous chapter.

Constraints on Event Composition

(38) *Init-Proc Coherence*:
   Given a decomposition $e_1 \rightarrow (e_2 \rightarrow e_3)$, some proper subpart of e_1 precedes e_2.

(39) *Proc-Res Coherence*:
   Given a decomposition $e_1 \rightarrow (e_2 \rightarrow e_3)$, e_3 must *not* temporally overlap e_2, but may temporally abutt it.

Thus, temporal independence in a causative structure will occur, as in resultatives, when the lexical item identifying the process part of the decomposition is distinct from that identifying the result portion.

6.3.3 Direct Causativization in *-aa*

We now have the ingredients for an analysis of the Hindi/Urdu system. The natural assumption here must be that the *-aa* suffix is actually the *init* head, or, more precisely, it is a lexical item which possesses just an *init* feature, and has default/impoverished lexical encyclopaedic content. This lexical item will be able to combine unproblematically with an unaccusative root type (as in (40)) to build a maximal first phase structure, as shown in (41) below.

(40) a. Makaan ban-aa
          house   make-PERF.M.SG
          'The house was built.'
      b. Anjum-ne   makaan ban-aa-yaa
          Anjum-ERG house   make-*aa*-PERF.M.SG
          'Anjum built a house.'

(41) **Unaccusative plus** *-aa*
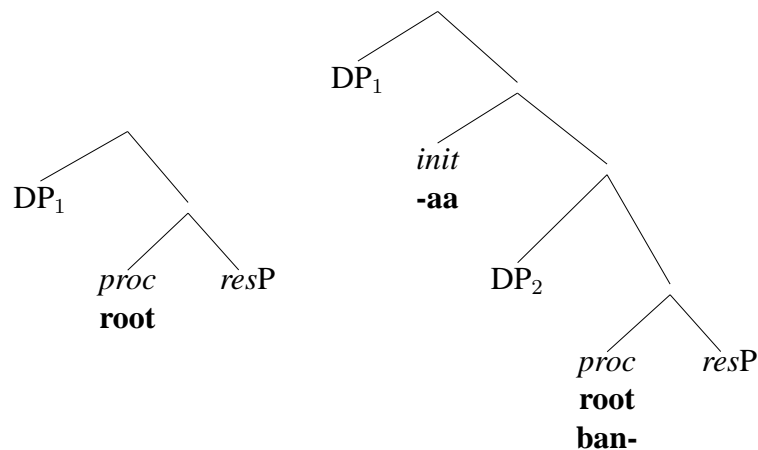
'*make*' : DP_1 *undergoes a making (DP1 gets made).*

'*make-aa*' : DP_1 *initiates (vaguely), leading to DP_2 getting made (DP1 makes DP2)*

   With the *-aa* initiation head, and the root that identifies *proc* and *res*, we have complementary ingredients for a transitive first phase predication. In many languages, productive causative morphology only attaches to unaccusative roots, as

might be expected from the assumption that each lexical item must satisfy all its category features.

However, we know already that this is not the situation in Hindi/Urdu and that *-aa* causativization attaches to roots of all types, even those that we have diagnosed as having *init* features themselves. So far, I have assumed that structure needs to be interpreted, but have been less explicit about whether category features on lexical items *have* to associate to structure. If 'underassociation' is indeed possible, it would have to be seriously constrained to avoid overgeneration. After all, it is not systematically possible to use intransitively any verb that appears in a transitive frame. In fact, we have already seen one such case in the discussion of particle constructions with already punctual verbs. Recall that we analysed a verb like *break* as already possessing a *res* feature, while the particle head was also productively analysed as bearing a *res* feature. I speculated then that allowing *break* to underassociate its own *res* was contingent on *res* actually still being present and identified.

Thus, if 'underassociation' is indeed possible, it seems to occur in contexts where the unassociated feature carried by the root is actually morphologically preeempted by another lexical item. Pursuing this line of thought, I suggest that features on a root may underassociate precisely when they are in an Agree relation with a syntactically present feature of the same type. This is a purely syntactic requirement, the lexical encyclopaedic content (LEC) of that root does not contribute to the interpretation of the feature in question— this being after all the defining property of underassociation. For the causativization of non-unaccusative verbs, some such assumption seems to be necessary.[9]

Assumptions Re Lexical Attachment:
(i) Lexical encyclopædic content (LEC) is associated with a head in the functional sequence via the lexical element that merges in that position.
(ii) Roots possess category features, but under certain conditions they are allowed to 'under' -attach, leaving some lexical encyclopaedic content (LEC) unassociated to a functional head. In such cases, the category feature must however be syntactically licensed by Agree within the phases.
(iii) Unassociated encylopædic content can semantically license adjuncts.

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[9]The condition on underassociation of category features given here is to be taken as a *necessary* one. I have no idea whether it is sufficient. A detailed typological examination of complex predicate types would be needed to see if any other factors are involved. It certainly seems clear that Hindi/Urdu tolerates underassociation to a great degree, as we have seen also in its ubiquitous use of light verbs.

Specifically, then, if we turn to the situation where the *-aa* suffix attaches to transitive root, we get a situation where the *-aa* will itself fill the *init* head and introduce its own argument, while the *init* feature of the root must remain unassociated. This means in turn that the lexical semantic content of *init* is vague/contextual and any kind of causer is allowed. The root will identify the *proc* head directly and the two subevents will be interpreted via the general causational relation.

(42) (a) Anjum-ne   paoda kaaṭ-a
          Anjum-ERG plant   cut-PERF.M.SG
          'Anjum cut a/the plant.'

      (b) Anjum-ne   paoda kaṭ-aa-yaa
          Anjum-ERG plant   cut-*aa*-yaa
          'Anjum had Saddaf cut a/the plant.'

(43) **Base-transitives plus** *-aa*
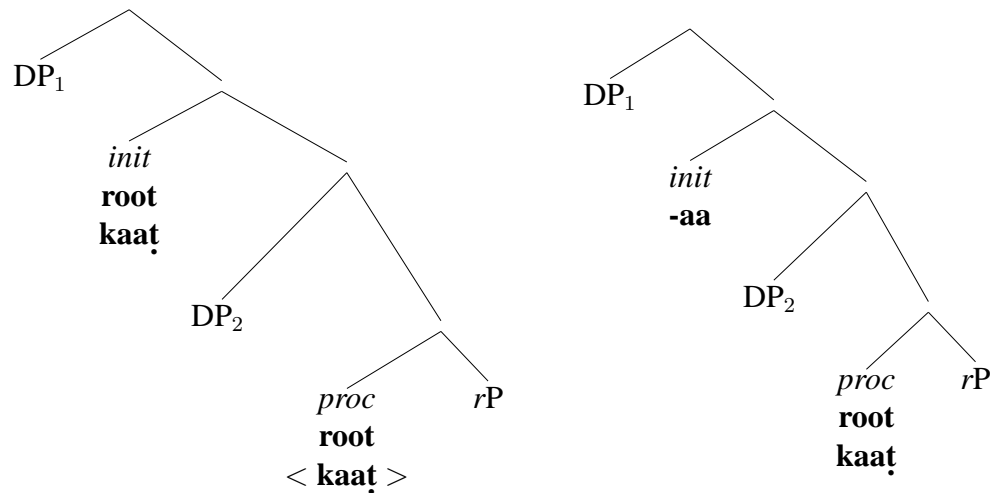
'*cut_{trans}*' : DP_1 *initiates cutting-wise and* DP_2 *undergoes a cutting (also achieves result of cutting (DP1 cuts DP2).*

'*cut_{trans}-aa*': DP_1 *initiates (vaguely), and* DP_2 *undergoes cutting and result of cutting (DP1 has DP2 cut).*

The analysis whereby the subject of the *-aa* causative is a general/vague causer, not necessarily encyclopædically associated with the root's lexical content, makes

sense of the pattern we saw earlier, whereby *-aa* causatives can in principle have abstract or stative causers as their subjects. The example verb meaning are repeated here in (44).

(44) (a) *ban-aa-naa* — 'John's money built that house.'
    (b) *pak-aa-naa*— 'The sun ripened the fruit.'
    (c) *suljh-aa-naa*— 'The new arrangements simplified the problem'
    (d) *ubalaa-naa* — 'The kettle boiled the water very fast.'
    (e) *dhul-aa-naa* — 'The rain washed the clothes'

This analysis makes direct sense of the fact that 'causee' adjuncts are licensed with *-aa* causativization precisely when there is an unassociated root feature that would have that 'causee' as its subject. Thus, the actual initiation of cutting, the *doing* of the cutting by someone, as it were, is still part of the lexical encyclopædic content of the root and accessed by the interpretational mechanisms, making the causee adjunct interpretation felicitous, Crucially, though, the surface subject of the causative verb is not necessarily the 'cutter' but merely someone who is responsible for a situation that does in fact lead to the 'plant undergoing the cutting'.

Consider now the case of unergatives. These verbal roots have a single argument that is an UNDERGOER-INITIATOR. Like the transitives, the addition of the *-aa* morpheme will lead to underassociation of the *init* feature of the root. Recall that these verbs are those in which the UNDERGOER of the process has some degree of control over their own motional or bodily function and will be coindexed with the root's INITIATOR—- this indeed is still part of the semantics of the root. Under *-aa* causativization, however, some degree of volition is of necessity suspended, as the surface subject causer is interpreted as being able to control the physical functioning of the being undergoing the process. As reported in Bhatt 2003a, Saksena 1982, objects of 'causativized' unergatives seem to have rather different felicity conditions regulating them than the subjects of the corresponding intransitive. In particular, it is often reported that these objects have to be children, invalids, non-human, or otherwise (contextually) controllable.

(45) (a) patang/chiṛiyaa uṛ rahii   hai
       kite/bird   fly PROG.F be-PRES.SG
       'The kite/the bird is flying.'
   (b) Anjali patang/*?chiṛiyaa uṛaa rahii   hai
       Anjali kite/bird   fly   PROG.F be-PRES.SG
   'Anjali is flying a kite/* a bird.'

(46) **Unergatives**
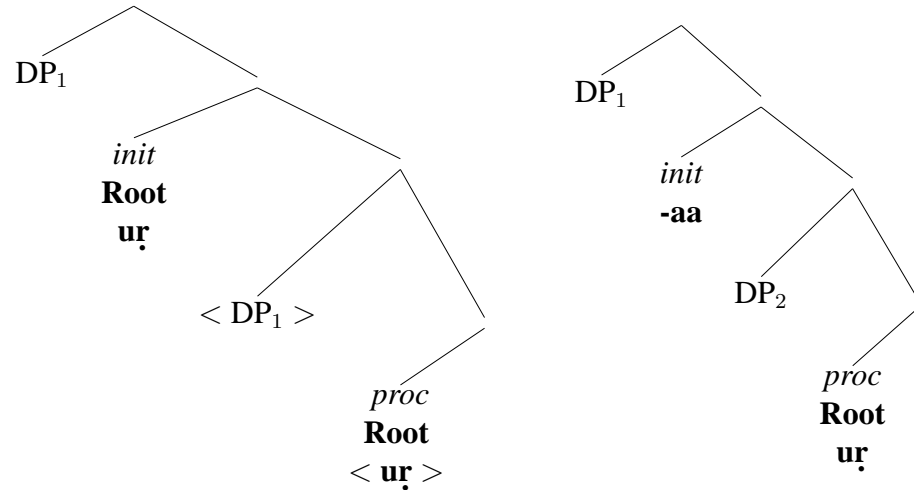
'fly': some internal property of DP$_1$ initiates/gives rise to flying motion and thus undergoes a flying motion (DP1 flies)

'fly'-aa: DP$_1$ initiates vaguely, leading to DP$_2$ undergoing flying motion. (DP1 makes DP2 fly)

Ingestive transitives are just like the unergatives, by hypothesis, in having an initial subject that is an UNDERGOER-INITIATOR. Their internal argument is actually a PATH, not an UNDERGOER. Adding the *-aa* allows the initial subject to remain, but in UNDERGOER position. Crucially, the availability of the PATH position unaffected which is why these verbs retain their full set of arguments when causativised. This immediately predicts a ditransitive structure for these verbs under causativization. Recall that our analysis of ditransitives in English also involved generating one of the arguments in complement (i.e. rhematic, or non-specifier position). This is also what underlies the ditransitive structures created here. What is criterial of the ingestive class is that, even though they are transitive, their surface 'subjects' are also UNDERGOERS and affected in some way. The direct object in these events is not an UNDERGOER itself, but a PATH argument.

(47) (a)Saddaf-ne   khaanaa kha-yaa
        Saddaf-ERG food   eat-PERF.M.SG
        'Saddaf ate food.'
     (b) Anjum-ne   (*Ram-se) Saddaf-ko   khaanaa khil-aa-yaa
         Anjum-ERG Ram-INSTR Saddaf-ACC food   eat-*aa*-PERF.M.SG
         'Anjum fed Saddaf food (*through the intermediary of Ram).'

(48) **Ingestive Transitives plus** *-aa*
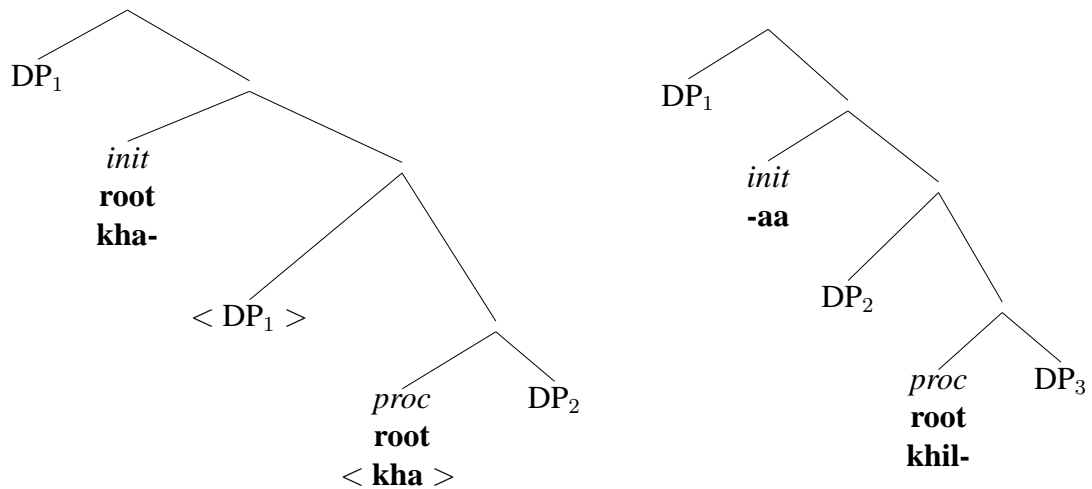
'eat' : DP$_1$ *initiates eating activity and thus undergoes an eating process/experience described by the* PATH*, DP$_2$. (DP1 eats DP2)*

'eat'-aa: *DP$_2$ initiates (vaguely), leading to DP$_2$ undergoing the eating process/experience as described by the DP$_3$* PATH*. (DP1 feeds DP2 DP3)*

   All of the cases of *-aa* causativization involve the insertion of *-aa* under *init*. The causation asserted here will always be temporally dependent, since no disjunction between *proc* and *res* arises. On the other hand, the insertion of *-aa* will always add a causer to an otherwise non-initiation event, or in the case of initiation events, allow the expression of a 'pure' cause— one which is not necessarily experientially involved.

6.3.4 'Indirect' Causativization in *-vaa*

The analysis I will be pursuing, in the absence of evidence for recursion in Hindi/Urdu causativization, is that the semantics of 'indirect' causation arises from the way

in which the subevents of the first phase are lexically identified. If Levin and Rappaport-Hovav 1999 are correct in distinguishing a class of indirect resultatives, where the most embedded result is temporally and lexically distinct from the description of the process that leads up to it, then it is plausible that *-vaa* causatives could be describing that very kind of event. Since *-vaa* is morphologically composed of *-aa* and *-v*, I will that assume that it inserts to fill both the *init* and *proc* heads, leaving the root verb to just identify *res*. Also potentially relevant to this analysis, is the observation in Bhatt 2003a that the only base verbs that do *not* take *-vaa* in Hindi/Urdu are those that cannot occur in perfect participial form in combination with the 'light verb' *ja-* -'go', the so-called analytic passive.[10]

I will thus assume that *-v* merges as *proc* and that *-aa* merges as *init*, as before, where the two specifier positions are identified, giving rise to a single UNDERGOER-INITIATOR argument. The root fills the *res* head and encyclopædically identifies the final result attained by the single non-causer argument, the RESULTEE. Given that the *-vaa* suffix multiply inserts and takes up so much 'space' in the first phase decomposition, any verb root that combines with it will have to leave some of its own category features unassociated. This will always be syntactically legitimate because of the presence of *init* and *proc* heads in the structure. No temporal overlap or common lexical content is asserted for the *proc* and *res* subevents in the case of *vaa* causativization; thus the whole event will be interpreted as involving an 'indirectly caused' result.

(49) anjum-ne   (mazdurõ-se)   makaan ban-vaa-yaa
     anjum-ERG labourers-INSTR house   be made-*vaa*-PERF.M.SG
     'Anjum had a house built by the labourers.'

(50) **Unaccusatives plus** *-vaa*

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[10]Bhatt (2003) actually uses this fact to motivate an analysis of *-vaa* causativization which explicitly embeds passive substructure. I will pursue a different but related claim here, namely that the root identifies only the result subevent *res* in *-vaa* causativization, a fact that it has in *common* with the construction involving the 'passive' light verb 'go'. The reason I reject the idea of explicit passive substructure in *-vaa* causatives is that unaccusative intransitive roots do causativize in *-vaa* although they do not passivize. Also in the analytic passive, the root takes on the perfect participial form, where as the morphology for the *-vaa* causative involves a bare root.
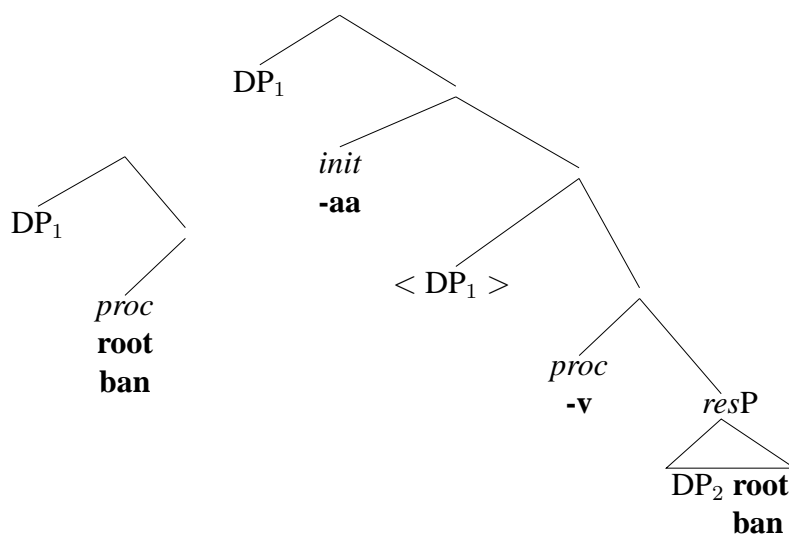
'make' : DP₁ undergoes a making (DP1 gets made).

'make-vaa' : DP₁ initiates and undergoes some process so that DP₂ ends up getting made.

One possibly surprising feature of this analysis is the claim that the surface subject 'causer' is an UNDERGOER-INITIATOR, like the subjects of unergatives and motion verbs in English. However, distributional facts about the semantic selectional restrictions on the subjects of *-vaa* causatives suggest that this is not entirely implausible. Recall that causes can be abstract states in principle, but that abstract conditioning states cannot be conceived of as being, in addition, UNDERGOERS. Abstract conditioning states or inanimate causes turned out to be systematically impossible with *-vaa* causativization, as reported above. This would be a surprising fact from the point of view of an analysis that simply took *-vaa* as an 'outer' or more 'syntactic' causative. It is at least potentially explicable on the story proposed here: the 'subject' of a *-vaa* causative must be an UNDERGOER-INITIATOR regardless of the contextual causational process involved in the particular event. The subject must therefore be interpreted as an active 'experiencer' of the process, and therefore a deliberate and conscious participant. This in turn requires a volitional and sentient agent in subject position.

A simple, less decompositional alternative to this analysis, is to claim that *vaa* is just a morpheme that multiply inserts as *init* and *proc*. Since it is a lexical item in its own right, we can assume it carries its own (fairly impoverished) lexical encyclopædic content in identifying the process and initiation phases of the macro

event. A possible solution therefore is to claim that this lexical item carries the
encyclopædic content associated with active volitional causation. The most im-
portant aspect of the proposal given here, however, is that the root in these cases
identifies only the results of the action, and that therefore the relation between
causational process and outcome are conceived of as indirect, as in Levin and
Rappaport-Hovav's indirect resultatives.

Concretely, for the unergatives and transitive roots combining with *-vaa*, we
find the root forced to identify just the *res* subevent while the *-vaa* takes up both
init and *proc*, giving rise to the semantics of indirect causation.

(51) Anjum-ne   Saddaf-ko   hãs-vaa-yaa
     Anjum-ERG Saddaf-ACC laugh-*vaa*-PERF.M.SG
     'Anjum made Saddaf laugh (by means of the clown).'
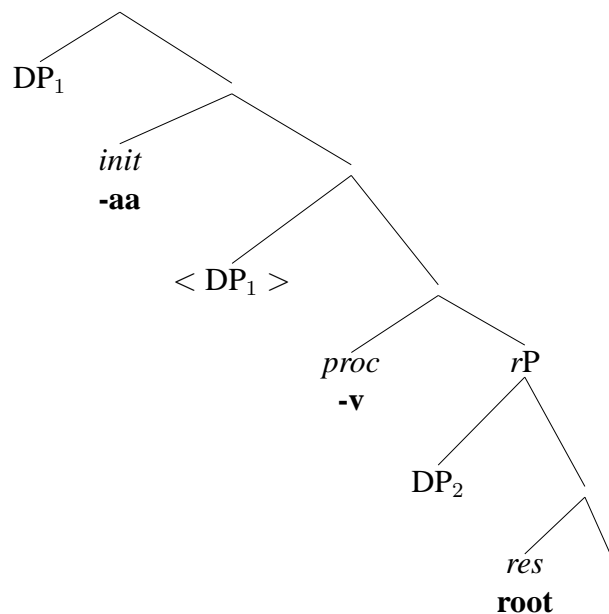
(52) **Unergatives with** *-vaa*
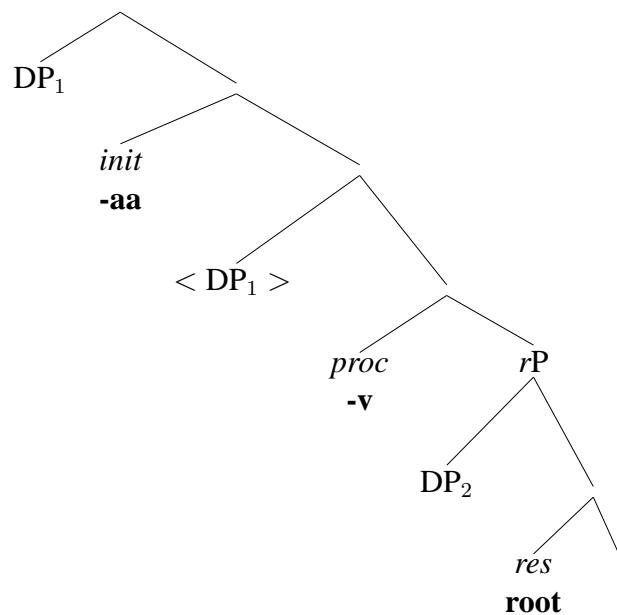
*DP$_1$ initiates and undergoes some process so as to bring about the result of DP$_2$
laughing. (DP1 had DP2 laugh).*

In the case of the unergative root 'laugh', we find the selectional restrictions
on the object are less than with the corresponding *-aa* causativization. This is
because in the latter case, the object is the UNDERGOER of the laughing process,
which is somehow being initiated by the subject. The 'laugher' must therefore be

conceived of as being directly controllable. However, with the *vaa* causative, no such direct relation exists since the process that the subject initiates is not itself the laughing process—- the causation is indirect, and therefore consistent with actions like persuasion or a deliberate effort to be amusing.

(53) Anjum-ne   saddaf-se   paoda kaṭ-vaa-yaa
     Anjum-ERG saddaf-INSTR plant cut-*vaa*-yaa
     'Anjum had Saddaf cut a/the plant.'

(54) **Base transitives with** *-vaa*

```
              DP₁
                    init
                    -aa
                        < DP₁ >
                                    proc        rP
                                    -v
                                          DP₂
                                                res
                                                root
```

DP₁ initiates and undergoes some process so that DP₂ can achieve the result of cuttedness (DP₁ had DP₂ cut)

If we compare this latter situation with the analysis I gave for the *-aa* causative for 'cut', we can see that there is indeed a clear overlap in the situations that they describe. For the causative in *-vaa*, above, the result is indirect, but for *-aa* the result is a direct result of the process of 'cutting' and the relation between that process and the initiation is vague and contextually sensitive. The main difference between the two constructions would be that in the *-vaa* causative the deliberateness and volitionality of the causer are emphasised, and indeed obligatory, while

the *-aa* causative is potentially compatible with abstract, stative or unintended causing.

When it comes to the ingestive transitives, once again the root only identifies the *res* portion of the macro event. The two original arguments of the ingestive become the RESULTEE and RHEME OF RESULT respectively. The meaning of this form is that the causer intends, and brings about the final result of Saddaf's consumption of the food.

(55) Anjum-ne   (Ram-se)   Saddaf-ko   khaanaa khil-vaa-yaa
      Anjum-ERG Ram-INSTR Saddaf-ACC food   eat-*vaa*-PERF.M.SG
      'Anjum brought it about that Saddaf ate food (through the intermediary of Ram).'

(56) **Ingestive Transitives with** *-vaa*
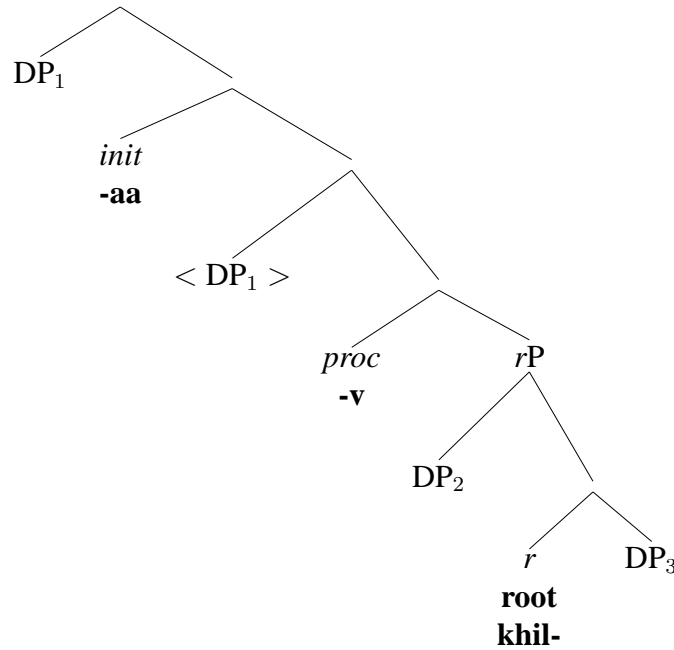
DP$_1$ initiated and experienced a process so that DP$_2$ could come to eat DP$_3$. (DP1 had DP2 eat DP3)

6.3.5   Event Underassociation and the Intermediate Agent/Causee

To summarize, the analysis given in the above subsections, the difference between direct and indirect causation for the two morphemes is captured by the difference

in lexical specification for category features of the two different morphemes. The analysis is given again in incapsulated form in (57) below.

(57) **Direct Causativization in** *-aa*

●The *-aa* suffix bears an *init* feature. It can form a structure together with roots of various different types.

●If the root in question also has an *init* feature, it will remain unattached (implicit).

●Since *proc* and *res* are identified by the same lexical root, the complex causative structure will be interpreted as 'direct', or 'temporally dependent'.

'Indirect' Causativization in *-vaa*

●The *-vaa* suffix bears both *init* and *proc* features. It can form a structure together with roots of various different types.

●*-vaa* always forces underattachment of the root's own category features. The root itself always identifies only *res*.

●Since *proc* and *res* are always identified by different lexical items, the complex causative structure will be interpreted as 'indirect', or 'temporally independent'.

In this section, I will argue that the analysis in terms of underassociated category features representing subevents, gives a better account of the distribution of the *-se*-marked adjunct than one that involves a correlation with suppressed or implicit agent arguments. One thing that is often only noted in passing in the literature on *-se* in this context is that it is always felicitous as an adjunct referring to an instrument, when attached to an inanimate DP. This is important to bear in mind and will be relevant to the proposal which emerges later. For now, the data I present on the interpretation of the *-se* marked optional adjunct concerns whether it has an 'intermediate agent' reading.[11].

As one can see from (58), the intermediate agent reading is absent from a sentence containing a base transitive.

(58) *Base Transitive*
Anjum-ne   (*Saddaf-se) peṛ kaaṭ-aa
Anjum-ERG   tree cut-PERF.M.SG
'Anjum cut the tree.'

The relevant reading is also completely impossible for *-aa* causativization of unaccusative roots (59). This is perhaps not surprising, since the structures and features I have offered for (58) and (59) respectively are identical.

(59) *AA-Causative Based on Unaccusative Root*
    Anjum-ne   (*mazdurõ-se) makaan ban-aa-yaa
    Anjum-ERG   house   make-*aa*-PERF.M.SG
    'Anjum built a house.'

For *-aa* causatives based on unergatives, transitives and ingestives, we find an interesting dialect split. The forms cited in the literature (specifically Saksena 1982), and two of my informants accepts the intermediate agent reading here (although reports a preference for the *-vaa* form in all cases).[12] One other speaker considers these ungrammatical.

(60) *AA-Causative Based on Unergative Root*
    Anjum-ne   (% masxaraa-se) Saddaf-ko   hãs-aa-yaa
    Anjum-ERG (clown-INSTR)   Saddaf-ACC laugh-*aa*-PERF.M.SG
    'Anjum made Saddaf laugh (% by means of the clown).'

(61) *AA-Causative Based on Base Transitive Root*
    Anjum-ne   (% ? Saddaf-se) peṛ kaT-aa-yaa
    Anjum-ERG (Saddaf-INSTR)   tree cut-*aa*-PERF.M.SG
    'Anjum cut the tree/ % ? had Saddaf cut the tree.'

(62) *AA-Causative Based on Ingestive Transitive Root*
    Anjum-ne   (% Saddaf-se) Ram-ko   khaanaa khilaayaa
    Anjum-ERG Saddaf-INSTR Ram-ACC food   eat--*aa*-PERF.M.SG
    'Anjum had Saddaf feed Ram food.'

When we turn to the causatives in *-vaa*, we find that the *-se* marked intermediate agent reading is available for *all* possible forms.

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[12]The version with the base transitive is the worst of these three. The morphological form given here is actually ambiguous between being an *-aa* causative of a transitive as intended here, or the *-aa* causative of an unaccusative. On the latter interpretation, the *-se* marked causee should be completely ungrammatical. I assume this is what is interfering with speaker judgements in this case.

(63) *VAA-Causative Based on Unaccusative Root*
Anjum-ne   (mazdurõ-se)   makaan ban-vaa-yaa
Anjum-ERG (labourers-INSTR) house   make-*vaa*-PERF.M.SG
'Anjum had a house built (by the labourers).'

(64) *VAA-Causative Based on Unergative Root*
Anjum-ne   (masxaraa-se) Saddaf-ko   hãs-vaa-yaa
Anjum-ERG (clown-INSTR) Saddaf-ACC laugh-*vaa*-PERF.M.SG
'Anjum made Saddaf laugh (by means of the clown).'

(65) *VAA-Causative Based on Base Transitive Root*
Anjum-ne   (Saddaf-se)   peṛ kaṭ-vaa-yaa
Anjum-ERG (Saddaf-INSTR) tree cut-*vaa*-PERF.M.SG
'Anjum had the tree cut by Saddaf.'

(66) *VAA-Causative Based on Ingestive Transitive Root*
Anjum-ne   (Saddaf-se)   Ram-ko   khaanaa khil-vaa-yaa
Anjum-ERG (Saddaf-INSTR) Ram-ACC food   eat--*vaa*-PERF.M.SG
'Anjum had Saddaf feed Ram food.'

The first point which emerges from this more careful look at the data is that a simple generalization in terms of suppressed or implicit agent is not possible. If the existence of an implicit agent is diagnosed primarily by the loss of a participant argument in going from the base verb to its causativized version, we can see that the possibility of the causee reading for -*se* does not correlate with it.

(67)

Verb Type	Causee?	Implicit Arg?
Base Trans	NO	NO
AA-Causative		
of unacc.	NO	NO
of unerg.	%	NO
of trans	%	YES
of ingestive	%	NO
VAA-Causative		
of unacc.	YES	NO
of unerg	YES	NO
of trans	YES	YES
of ingestive	YES	NO

There is in fact independent evidence that a *-se* intermediate agent reading is not licensed by a demoted agent argument. In the passive of a simple transitive verb, a *-se* adjunct with the intended reading is not possible.[13]

(68) *Passive of a Transitive Verb*
    peṛ (*anjum-se) kaaṭ-aa   gay-aa
    tree   cut(trans)-PASS go-PERF.M.SG
    'The tree was cut.'

Most colloquial speakers of Hindi/Urdu disprefer the expression of an agent at all in constructions such as (68) above. However, in more formal registers, if such a meaning is required, some speakers can use the post position *-dwara-* 'by means of' for this use (never *-se*).[14]

(69) *Passive of a Transitive Verb*
    peṛ (anjum-dwara) kaaṭ-aa   gay-aa
    tree anjum-by   cut(trans)-PASS go-PERF.M.SG
    'The tree was cut by Anjum.'

On the other hand, if one tries to passivized a verb form that has already been causativized in *-vaa*, the intermediate agent *-se* marked adjunct resurfaces as a possibility.

(70) *Passive of VAA-Causative of Transitive Verb*
    Ram-se   peṛ kaṭ-vaa-yaa   ga-yaa
    Ram-INSTR tree cut-*vaa*-PASS go-PERF.M.SG
    'The tree was cut through Ram's actions.'

However, the fact that this is not picking out the same argument as a true demoted agent is suggested by the fact that a *-dwara* marked argument can actually be added to the sentence already containing the *-se*, as in (71).

(71) *Passive of VAA-Causative of Transitive Verb*
    Anjum-dwara Ram-se   peṛ kaṭ-vaa-yaa   ga-yaa
    Anjum-BY   Ram-INSTR tree cut-*vaa*-PASS go-PERF.M.SG
    'The tree was caused to be cut by Ram, by Anjum.'

---

[13]The *-se*-marked argument here can be interpreted as the holder of an ability. I will not explicitly address the abilitative reading of *-se* here. But see the conclusion of this section for some speculations.

[14]This basic fact is discussed in Bhatt 2003b, to whom I am also grateful for discussion.

The possibility of the *-se* as intermediate agent is directly connected to the *-vaa* morphology, and not to the passive, as the following minimal pair shows.

(72) *Passive of AA-Causative of Unaccusative Verb*
  a.makaan (*anjum-se) ban-aa-yaa ga-yaa
   house   build-*aa*-PASS go-PERF.M.SG
   'The house was built.'
  Passive of VAA-Causative of Unaccusative Verb
  b. makaan (anjum-se) ban-vaa-yaa ga-yaa
   house   build-*vaa*-PASS go-PERF.M.SG
   'The house was built (through the actions of Anjum).'

This brief excursion into the passive construction confirms what we have seen already, namely that the possibility of the intermediate agent reading is (i) independent of passive and (ii) not actually licensed by a demoted agent argument. What then, is correlated with the appearance of this interpretation (other than the *-vaa* morphology itself)? If we chart the possibility of the causee reading against the implicit *subevents* in my analysis of each type, we get a much more regular picture.

(73)

Verb Type	Causee?	Implicit Subevent?
Base Trans	NO	NO
AA-Causative		
of unacc.	NO	NO
of unerg.	%	*init*
of trans	%	*init*
of ingestive	%	*init*
VAA-Causative		
of unacc.	YES	*proc*
of unerg	YES	*init, proc*
of trans	YES	*init, proc*
of ingestive	YES	*init, proc*

Thus, it seems to be that the possibility of the intermediate agent reading is correlated strongly with the existence of an underassociated/implicit *proc* feature in the structure. The dialect split also has a ready explanation: some speakers tolerate the reading if there is only an *init* subevent left implicit, although they all prefer the *proc* version.

An explicit semantics for the interpretation of adjuncts is beyond the scope of this monograph, but I will outline an intuitive proposal that would make sense of the correlation we have seen.

•The *-se* phrase is an adjunct which is a subevent modifier. In all cases, it is interpreted as information cotemporaneous with the subevent that it modifies.
•*-se* phrases can modify both present and implicit (underassociated) subevental information: if it modifies the identified *proc* it is interpreted as 'instrument'; if it modifies *init* it can be a manner or means modifier; if it modifies an *implicit proc*, it is interpreted as an intermediate actor. For some speakers, modification of an implicit *init* can also give rise to this reading, but is more difficult.

The intermediate agent interpretation arises from a combination of factors. The *-vaa* suffix insertion insures that the relation between the causational *proc* and the *res* identified in the first phase is indirect (no temporal abuttment). The process that *would* be more temporally related to the lexically identified result, remains implicit. Any modification of that, more temporally related process is consistent with a reading in which the participant is intimately connected to that process. For some speakers, association with an implicit *init* is enough, but more difficult since the causation in this case is temporally direct, and it is hard to see how there would be 'room' for an intermediate agent.

One other feature about *-se* is important to mention:*-se* phrases have obligatory anti-volitive or 'out of control' semantics. Even when they occur as animate 'causees' , it is the true subject that is always the intentional controller. Because *-se* occurs in a structure where the causation chain is explicitly represented as belonging to the arguments introduced by *-vaa*, the *-se* marked argument cannot be in control. I assume that this is part of the semantics of the *se* lexical item, which makes it ideally suited to marked inanimate instruments, but semantically in compatible with genuine demoted agents in the passive. I note in passing that 'lack of control' is also a property of the *-se* marked arguments of the abilitative construction, in both its 'accidental' and 'inabilitative' guises. I leave a unification of these uses of *se* to further research.

6.3.6   Consequences

What I have shown in the previous sections is that a complicated distribution of direct vs. indirect causation interpretations can be accounted for with a small set of theoretical assumptions, many of which appear to be independently necessary

in the analysis of other data. I argued that it is a mistake to analyse the two different causative morphemes in Hindi/Urdu in terms of a complete recursion of the first phase (or, equivalently, as a lexical vs. syntactic distinction). Instead, I claimed that the semantics of indirect causation can be achieved within the first phase itself by pursuing the logic of what it means for a particular root to identify a subevent/category head with its lexical encyclopædic content. While the heads *init*, *proc* and *res* are uniformly linked by the general cause or leads-to relation, differences emerge depending on how the content of those subevents is lexically described. Specifically, if the process that leads to a result has different lexical encyclopædic content from that result, then the two subevents are less organically related (more independent, less direct) and may even involve temporal disjunction even though cause and effect can be detected. The difference between *-aa* and *-vaa* causation is then that the former suffix fills the *init* head, while the *-vaa* suffix fills both the *init* and *proc* heads, causing a disruption/indirection between the process instigated by the causer and the actual final state caused.

The analysis I propose immediately accounts for the fact that there is no explicit morphological or semantic embedding found with the two morphemes in question, and that both suffixes attach in principle to the same types of roots, with the same effects on valency. In addition, the analysis makes sense of the fact that the *-vaa* morpheme actually includes the *-aa* suffix as a subpart, since it structurally includes it as well. Since both suffixes are internal to the first phase, we predict that both forms will be subject to idiomatic and lexicalized interpretations equally. This is indeed what we find— while both suffixes are reasonably regular and semantically compositional, coventionalized forms and meanings appear with either *-vaa* or *-aa* versions of a verb. I do not actually rule out recursion in principle. There may be languages and causational devices that do not occur within the first phase, or fully biclausal causative constructions. My purpose here has been to investigate the properties of the building blocks of subevental complexity, before such recursion is taken into account.

In constructing the analysis, I needed to make certain important assumptions about the way the system works, and in particular about the way in which different lexical or morphological pieces are allowed to combine. What we found in Hindi/Urdu is that root category features are allowed to remain unassociated provided they are licensed by the presence of those features in the syntactic structure anyway. I assumed that a mechanism similar to Agree is responsible for this descriptive generalization. As we saw, unassociated features remained semantically active and facilitated the presence of certain adjuncts.

6.4   The Permissive Causative in Hindi/Urdu

In the analysis of the Hindi/Urdu causative system given so far, I argued that no recursion of the elements found in the first phase was necessary to give an account of the generalizations in the data. Hindi/Urdu also has a more analytic looking construction, the 'permissive' (cf. Butt 1995), which shares many of the causative properties of morphology described above. The 'permissive' is what Butt 95 terms a 'complex predicate' construction and it has also posed classical problems for traditional analyses concerning the distinction between the 'lexicon' and the 'syntax'.

In these constructions, the inflecting 'light' verb (using 'let' here as a typical case) combines with a main verb in the oblique inflectional form of the infinitive.[15]

(74) kis-ne   kutte-ko   ghar ke andar   **aa-ne**   **diyaa?**
     who-OBL-ERG dog-M.Obl.Dat house GEN.OBL inside come-INF.OBL give-PERF.M.SG
     'Who let the dog come into the house?'   (Glassman 1976:235)

One important fact about the above type of construction is that it can be shown from a wide variety of different diagnostics in the language that they have all the properties of monoclausal as opposed to biclausal predication. In particular, from the point of view of anaphor-antecedent relations, the possibility of control, and agreement phenomena, these constructions behave like a single clause with a single subject (see Butt and Ramchand 2004 for detailed argumentation).

In earlier work, Butt and Ramchand 2004 argued that the permissive-type of complex predicate was built up with the 'light' verb appearing in the *init* position of the first phase decomposition, and the main verb in the process portion. The 'light' verb is drawn from a reduced inventory of possible verbs (predominantly 'give' and 'take' in the case of the permissive), which can then combine with any main verb in the language productively to give a regular and predictable semantics. In particular, we consistently get the addition of a causer. Consider the examples below.

(75) (a) nadya-ne   anjum-ko   nikal-ne   di-ya
          Nadya.F-ERG Anjum.F-DAT emerge-INF.OBL give-PERF.M.SG
          'Nadya let Anjum get out.'
      (b) anjum-ne   saddaf-ko   xat   likh-ne   di-ya
           Anjum.F-ERG Saddaf.F-DAT letter.M write-INF.OBL give-PERF.M.SG
           'Anjum let Saddaf write a letter.'

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[15]The infinitive also functions as a verbal noun (cf. Butt 1995).

In all cases, the arguments related to the infinitival verb include everything but the subject. The subject, on the other hand, is the external agent or causer of the whole event, with the specific mode of causation (facilitation in the examples above) depending on the specific choice of light verb.

One can compare the 'permissive' complex predicate in (75a) above with the morphological causative of the same verb, as in (76), where both sentences show the same type of valency addition.

(76) nadya-ne   anjum-ko   nikaal-aa
     Nadya.F-ERG Anjum.F-ACC emerge-VAA-PERF.M.SG
     'Nadya pulled Anjum out.'

However, there are a number of good reasons not to give the permissive the same kind of analysis as the morphological causative. The first is the existence of nominalizing morphology on the main verb, which would remain unexplained under the analysis whereby the main verb simply merges as the *proc* part of the first phase. The second is the fact that unlike causativization, transitives do not 'lose' their original agent under the permissive construction. Compare the permissive of 'write' in (75b) above with the causative of the same verb in (77) below.

(77) Anjum-ne   (saddaf-se)   xat   likh-vaa-yaa
     Anjum.F-ERG Saddaf.F-INSTR letter.M-NOM write-VAA-PERF.M.SG
     'Anjum had the letter written (by Saddaf)'

More generally, while the argument structure and case-marking of a morphological causative is related straightforwardly to the choice of *-aa* vs. *-vaa*, the argument structure of a permissive is dependent on the valency and general properties of the main verb, with the obligatory addition of the one argument (external causer) contributed by the light verb itself. In other words, the permissive light verb construction seems like a genuine embedding of one verbal form within another (unlike what I argued for the indirect causation morpheme *-vaa*. These constructions, therefore, do involve a recursion of the first phase, with the light verb taking a complement which embeds a whole potential *init*, *proc res* sequence in its own right. This can be shown straightforwardly by the fact that causativized roots can be embedded under a permissive light verb (78).

(78) Nadya-ne   Saddaf-ko   (Bill-se)   xat   likh-vaa-ne   diyaa
     Nadya-ERG Saddaf-ACC Bill-INSTR letter-NOM write-VAA-INF give-PERF
     'Nadya let Saddaf have the letter written (by Bill).'

Intuitively, in the permissive, the notional agent or 'subject' of the infinitival verb 'raises to object position' and gets accusative case together with the thematic relation associated with undergoing the process of permission giving. The infinitival projection here must be porous enough to allow what has been called 'restructuring' in the literature (Rizzi 1978, Wurmbrand 2000), since Butt (1995) has shown very clearly that the permissive passes the tests for monoclausality with respect to agreement, anaphoric binding and control. Butt 1995 points out that the permissive construction differs minimally from control constructions where accusative case marking shows up on the infinitivally marked main verb. An example of the control construction is shown below in (79).

(79) Anjum-ne   saddaf-ko   [xat   likh-ne]-ko   kah-aa
     Anjum-ERG saddaf-ACC letter.M -NOM write-INF-ACC say-PERF.M
     'Anjum told Saddaf to write the letter.'

As an example of the contrast, a feminine object of the embedded clause triggers feminine agreement on the permissive light verb as shown in (80), but does not give rise to feminine agreement on the matrix verb in the 'tell' construction (81).

(80) Anjum-ne   saddaf-ko   ciṭṭhi   likh-ne   di
     Anjum-ERG saddaf-ACC letter.F -NOM write-INF give-PERF.F
     'Anjum let Saddaf write the letter.'

(81) Anjum-ne   saddaf-ko   [ciṭṭhi   likh-ne]-ko   kah-aa
     Anjum-ERG saddaf-ACC letter.F -NOM write-INF-ACC say-PERF.M
     'Anjum told Saddaf to write the letter.'

Thus, it seems that the accusative marked infinitival complement cannot 'restructure', and is fully biclausal, while the bare infinitival complement found with the permissive does. I will assume that the permissive in Hindi/Urdu is to be analysed along the lines of Wurmbrand 2000's VP complementation. The complement in question must be large enough to include initiational information but not so large that it includes an opaque phasal boundary. I will not pursue the details of such an analysis here, since it is beyond the scope of this monograph.

I have discussed the analytic 'causative' permissive in Hindi/Urdu because it is important to emphasise that the main claims of this monograph do not involve ruling out recursion of elements within the first phase. In fact, one of the important current research questions involves establishing onstraints on which pieces of

structure can be recursed, and which morphological devices signal opacity within a recursive derivation (phase theory more generally). Such questions are important, but apply equally to all theories of syntax. They go beyond the narrow concerns of this monograph. My aim here is to understand the basic building blocks of eventive predication— the topography of the verbal projection— even before recursion is taken into account. This is why is important to look at phenomena where one can observe plain base structures. I have argued that the Hindi/Urdu morphological causative system is one such case, and that the analytic permissive structures are not (although they utilize the same basic pieces).

6.5 Reinterpreting Internal and External Causation

One of the claims of the syntactic, or constructional approach to verbal complexity is that the morphological/lexical independence of the subparts of the first phase is epiphenomenal, and that the very same syntactic structures can be expressed synthetically, morphologically, or analytically depending on the language and the particular lexical items in its inventory.

Unlike Hindi, English is a language where transitive verbs are not systematically related to intransitive counterparts via a piece of morphology. In my terms, English expresses its complex event structures 'synthetically' in the core cases. So far, I have used the evidence of Hindi/Urdu morphological causatives to argue for the syntactic reality of the *init* head, and also to concretize my proposals about lexical attachment and sub-event coherence. Now I wish to turn to the cases of labile alternating verbs in English and reinterpret the facts in the light of the kind of theory advanced here.

Given the general system in place for connecting the event structure information within first phase syntax with the encyclopaedic knowledge of the lexical item, we are in a position to consider the variable behaviour verbs in more detail. We have seen that one class of verbs in English occurs in transitive-intransitive pairs. Levin and Rappaport Hovav 1995 argue that the transitive is the base form, and that the intransitive is derived by a lexical suppression of the CAUSE component in the item's lexical conceptual structure. Since not all transitive verbs with a CAUSE component actually have intransitive counterparts, a lexicon internal condition must be placed on the suppression mechanism. The conditions under which this suppression is supposed to be possible seem unconvincing to me. Basically, L and R-H argue that CAUSE may be suppressed precisely when the verb can be conceived of as being able to take place without any external causation (a

worryingly vague and unfalsifiable principle, but also one which would predict more contextual variability than there actually is). As for the principle itself, it seems unintuitive to say that these are the verbs that *must* have CAUSE in their lexical representation in the first place, since they are the very ones where we can conceive of the event without it! Reinhart 2002, who also takes the transitive-to-intransitive position is forced to claim that intransitive unaccusative verbs with no transitive counterpart, do nevertheless have a transitive counterpart in the lexicon which is 'frozen' and never surfaces. In the case of English, a far more satisfying system emerges if we take the derivation to occur in the other direction: while very many causative transitives fail to have intransitive counterparts, only a very small number of unaccusatives fail to causativize. Even a lexicon-internal rule of causativization would do a better job of predicting the pairs that exist than a suppression account.

Since I am working within a non-lexicalist set of assumptions, a 'lexicon-internal' rule of concept suppression (or addition) is not available. On the other hand, since structure can contribute interpretation in this system, causational semantics when it occurs does not have to inhere in the lexical semantics of the root in question.

Under the system so far, these were the verbs that did *not* already possess an *init* feature in their syntactic information, at least in their intransitive uses. The idea is that intransitive verbs that are more volitional, and already have specification of *init* will resist further causativisation.[16]

In the current system, there are at least two ways to approach the variable behaviour of a verb like *break* that participates in the alternation shown in (82).

(82) (a) The stick broke.
      (b) John broke the stick.

One strategy is to say that verbs of this type have an 'optional' *init* feature in their specification.

(83) Lexical Entry of *break*: [(*init*) *proc$_i$*, *res$_i$*]

This is a logical possibility, but in addition to expanding the logic the system greatly, it also misses a potentially important generalization— namely that a substantial majority of verbs of the unaccusative type have a causative version. If

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[16]Here I will claim that so-called unaccusative verbs like 'arrive' and 'fall' that fail to causativize in English are actually *init,proc*, *res* verbs with a single composite argument and are not counterexamples to the principle that all non-*init* verbs will causativize in English.

the few exceptions can be explained away, one is tempted to the conclusion that the addition of an initiational subevent, with its own independent argument seems to be a systematic possibility for *all* non-initiational verbs in English. There are a couple of other suspicious facts that should be accounted for: the INITIATOR that is added is always independent of the other arguments of the intransitive verb and has very general and unconstrained semantics with respect to encyclopaedic content, in other words, the verb *break* doesn't seem to impose much in the way of semantic selectional restrictions on the external argument. English is quite unusual crosslinguistically in the availability of a wide range of abstract causers in the subject position of most verbs.

(84) (a) Alex broke the window.
       (b) The storm broke the window.
       (c) Mary's carelessness broke the window.

Given the stated aims of this framework to eliminate Lexicon internal processes and primitives, and given the need to express this peculiar property of English in a simple way that would account for the possibility of crosslinguistic variation, we have one clear option open to us. I have suggested that English possesses a lexical item (unpronounced) which possesses default causational semantics and which can be associated under *init* in the general case, and which triggers incorporation of the verbal root into it, much like the Hindi/Urdu *-aa* suffix.

The analysis for English therefore lists intransitive 'break' as a lexical item with just the *proc* and *res* category features.

break: [$proc_i$, res_i]
run: [$init_i$, $proc_i$]
$\emptyset$: [*init*]

The null *init* head can be built on top of a structure where *break* has already merged, but not on top of a structure where *run* has merged, so that only the former will have a transitive counterpart. Under this analysis, English is very like Hindi/Urdu, except for the fact that in English *-aa* is unpronounced, and that English has a larger class of base transitives.

In fact, it is not strictly true that *run* in English cannot transitivize. There are at least two kinds of contexts where it does: one, where an explicit resultative subevent is added to the verb phrase; the other where more abstract, non leg-motion running is involved (85).

(85) (a) John ran the bathwater.
      (b) John ran the meeting.
      (c) John ran Mary's life.

In fact, we already have an explanation for these facts in place if we pursue the analogy to Hindi/Urdu *-aa* to its logical conclusion. Recall that *-aa* could attach to unergatives and to transitives as well as to unaccusatives, thereby forcing the category root features to be unassociated. If we assume that the same is possible in English (except that of course one wouldn't see any addition of morphology), then *run* should be able to transitivize as well. However, when it does so, (i) the lexical encyclopædic content of *run* would no longer be able to identify the initiational subevent, (ii) the UNDERGOER of the process would have to be distinct from the INITIATOR, and (iii) the UNDERGOER could not be a volitional or undergoing a process he/she has implicit control over. I claim that these constraints can only be met under a metaphoricization or bleaching of the meaning of *run* (reducing to something like 'continuous dynamic activity typical of undergoer'). Where this is conventionalized, transitivization will be possible with the null *init* head for those verbs. More generally, it is also plausible that the general causational *init* head is what is merged when transitive verbs in English appear with abstract causes as subjects instead of subjects with the expected active involvement in the event (86).

(86) (a) This sofa seats three.
      (b) The wind threw the clothes from the washing line.
      (c) The crime situation reduced the revenues from tourism.

It is well known that English is quite special in allowing this kind of range of abstract subjects for verbs. I speculate that this is a consequence of the null *init* head that it possesses, with such impoverished encyclopædic content. I leave the investigation of this line of thought to further research.

6.6   Conclusion

Against the recent dominant view in the theoretical literature, I have argued for a view of causativization that involves 'structure building', as opposed to 'lexical subtraction'. I have given an analysis of the patterns of Hindi/Urdu morphological causativization from a constructional viewpoint, where the suffixes found in this language actually morphologically spell out heads in the first phase syntax that I have been proposing. Specifically, the *-aa* suffix in Hindi/Urdu was argued to

be a pure *init* head, while *-vaa* spelled out *init* plus *proc* together. In accounting for the difference between direct and indirect causativization in Hindi/Urdu, I argued that recursion is not necessary to capture the difference in the relatedness of the subevents involved. In doing so, I made some specific proposals concerning the relationship between subevental integration and lexical identification. The notion of underassociation turned out to be important for this analysis, suitably constrained. The claim was that category features on a lexical item can fail to 'associate' or directly identify structure provided the feature did actually appear in the syntax. Thus, both Merge and Agree seemed to be possible as mechanisms to satisfy the category requirements of a lexical item. In the final part of the chapter I returned to the case of English alternating verbs to argue that they could be given the same kind of analysis as the Hindi/Urdu suffixation strategy. The main difference between the two systems was that the 'pronunciation' of the Hindi/Urdu *-aa* suffix was null in English.
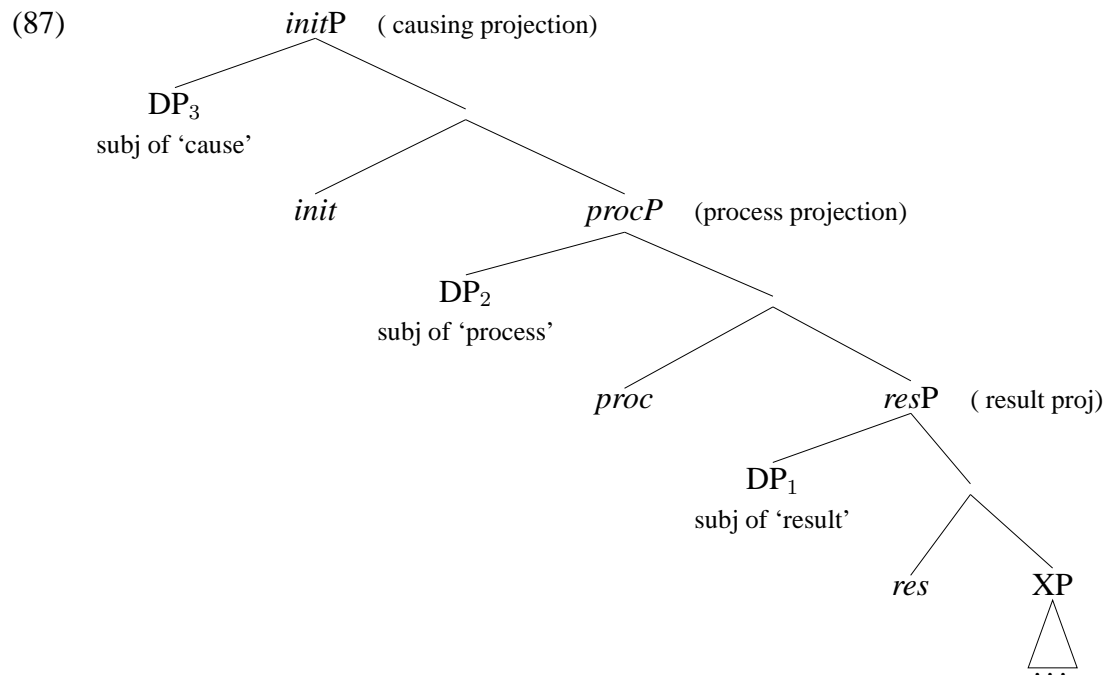
Chapter 7

Conclusion

7.1 Summary of the System

In this monograph, I have tried to work through some of the details of a very specific proposal concerning the decomposition of verbal meaning. Following the intuitions of Hale and Keyser 1993, Borer 2005 and others, I have argued that event structure and event participants are directly represented in syntax. The first phase syntax explored here is a binary branching structure for a particular functional sequence of heads, where structure and category label correspond systematically to meaning. In particular, specifiers are interpreted as the semantic subject of Head-complement complex, and embedded eventuality descriptors are interpreted as being unified by a generalized 'cause' or 'leads-to' relation. The other important semantic correlate of structure within the event domain is 'homomorphic unity': a phrase in the complement of an event-denoting head must co-describe that event, and I have proposed that natural language does this by imposing a matching requirement between the event-scale and a scale introduced by that complement. The first phase syntax and the rules of combination that I have argued for are repeated here as a summary.

(87)   *init*P   (causing projection)

    DP$_3$
    subj of 'cause'

          init   *procP*   (process projection)

             DP$_2$
             subj of 'process'

                  proc   *res*P   (result proj)

                        DP$_1$
                        subj of 'result'

                              res   XP
                                         . . .

The Specifiers of 'Event' Projections

- *init*P introduces the causation event and licenses the external argument ('subject' of cause = INITIATOR)

- *proc*P specifies the nature of the change or process and licenses the entity undergoing change or process ('subject' of process = UNDERGOER)

- *res*P gives the 'telos' or 'result state' of the event and licenses the entity that comes to hold the result state ('subject' of result = RESULTEE) .

Initiation, Process/Transition and Result Derived from Event Composition:

(88) Event Composition Rule:
    e = e1 → e2 : e consists of two subevents, e1, e2 such that e1 causally implicates e2
    (cf. Hale and Keyser 1993)

Assume that there are two primitive subsorts of eventuality:
a. State(e) : e is a state
b. Process(e): e is an eventuality that contains internal change

(89) $\exists$ e$_1$, e$_2$[State(e$_1$) & Process(e$_2$) & e$_1 \rightarrow$ e$_2$] $\longrightarrow_{def}$ Initiation(e$_1$)

(90) $\exists$ e$_1$, e$_2$[State(e$_1$) & Process(e$_2$) & e$_2 \rightarrow$ e$_1$] $\longrightarrow_{def}$ Result(e$_1$)

Toy Semantic Denotations for Event Heads

(91) $[\![$ *res* $]\!] = \lambda$Pλxλe[P(e) & *res'*(e) & State(e) & Subject (x,e)]

(92) $[\![$ *proc* $]\!] = \lambda$Pλxλe$\exists$e$_1$,e$_2$[P(e$_2$) & *proc'*(e$_1$) & Process(e$_1$) & e = (e$_1 \rightarrow$ e$_2$) & Subject (x,e$_1$)]

(93) $[\![$ *init* $]\!] = \lambda$Pλxλe$\exists$e$_1$,e$_2$[P(e$_2$) & *init'*(e$_1$) & State(e$_1$) & e= e$_1 \rightarrow$ e$_2$ & Subject (x,e$_1$)]

In the case of *proc* combining with a non-event head, the complement must bear the PATH role, where being a path requires the existence of a set of measures associated with the phrase. To fulfil the PATH role, the following two entailments must hold. This is a definition inspired by Krifka 1992 original Mapping-to-Objects and Mapping-to-Events.

(94) PATH(x, e) $=_{def} \exists$R$\exists$D$_x$[$\forall$e,d,d$'$[R(e,d) & d$' \leq$ d $\rightarrow \exists$e$'$[e$' \subseteq$ e & R(e$'$,d$'$)]
(mapping to measures) &
$\forall$e,e$'$,d$'$[R(e,d) & e$' \subseteq$ e $\rightarrow \exists$d$'$[d$' \leq$ d & R(e$'$,d$'$)]] (mapping to events)

(95) $[\![$ *proc* $]\!] = \lambda$yλxλe[Path(y,e) & *proc'*(e) & Process(e) & Subject(x,e)].

In fact, during the course of this monograph, a slightly weaker more informal definition of PATH was used, under the principle that I called *Homomorphic Unity*.

(96) **Homomorphic Unity**: When two event descriptors are syntactically Merged, the scalar structure of the complement must unify with the scalar structure of the head by means of a homomorphism. (i.e. the relevant scales must be synchronized and unified to describe the complex event).

Another important aspect of the system defended here is that participant relations can be (and most often are) composite. This means that a small number of event structure primitives and corresponding syntactic positions can be used to describe a larger number of different participant types, by simple rules of combination. The entailments corresponding to each participant type simply unify.

In the early part of the book, I tried to show how the different verb types in English could be distinguished using the primitives given by the system. While this cursory examination of necessity had to sacrifice depth of analysis for breadth of coverage, it at least gives some idea of flexibilities and predictions of the system. I repeat the table of verb types in English and their participant relations below. I leave more detailed analysis and refinements to further research.

	[*init, proc*]		
I	Transitive	INITIATOR, UNDERGOER	*drive, push, paint*
	Transitive	INITIATOR, PATH	*eat, read, paint*
II	Intransitive	INITIATOR$_i$, UNDERGOER$_i$	*run, dance*
	[*init, proc, res*]		
III	Transitive	INITIATOR, UNDERGOER$_i$, RESULTEE$_i$	*throw, defuse*
	Transitive	INITIATOR$_i$, UNDERGOER$_i$, RESULT-RHEME	*enter*
IV	Intransitive	INITIATOR$_i$, UNDERGOER$_i$, RESULTEE$_i$	*arrive, jump*
V	Ditransitive	INITIATOR, UNDERGOER PATHPP	*give, show*
	proc		
VI	Intransitive	UNDERGOER	*melt, dry, freeze*
	proc, res		
VII	Intransitive	UNDERGOER$_i$, RESULTEE$_i$	*break, tear*

The Vendler Classes:
'Activities' correspond to either [*init, proc*] or [*proc*] verbs; 'Accomplishments' are [*init, proc*] verbs with incremental theme or PATH complements; 'Achievements' are [*init, proc, res*], or [*proc, res*]; Semelfactives are verbs ambiguous between [*proc*] and [*proc, res*]; Degree achievements are [*proc*] verbs with an implicit property scale path.

The system proposed in this book is generative-constructional in spirit, in that it allows the semantics of event structure and participanthood to be built up compositionally as opposed to being explicitly stated in the lexical entries of verbs. I have tried to construct a system which does not rely on the lexicon as a module in the sense of lexicon-internal primitives, rules or operations. On the other hand, the lexical entries themselves are not totally devoid of syntactic information. I thus do not subscribe to the 'naked roots' view espoused by Marantz 1997a, Marantz 1997b and Borer 2005. Rather, the lexical item does come with syntactic information, but *only* that of category features—- primitives that the syntax is indepen-

dently known to manipulate. This syntactic 'tagging' information on the lexical entry is the syn-sem relevant information that allows the item to be deployed int he computational system. The lexical entry itself is a cross-modular bundle of associations, containing among other things, lexical encyclopædic information. Lexical encyclopædic information must be sharply distinguished from compositional semantic information under this system: only the semantic interpretation of structure is systematic and rule driven; the lexical encyclopædic content is formless from the point of view of the linguistic system (although it may be structured in more general cognitive terms). Syntactic category features on the lexical items sanction their Merge in particular syntactic positions, and conversely, syntactic category needs to be identified by specific encyclopædic content in order to create well-formed propositions which actually say something about the world.

During the course of the examination of complex predications, I assumed that while syntactic category had to be identified by lexical content, I allowed the syntactic category features on lexical items to 'underassociate' provided that they could be licensed in the structure.

Assumptions Re Lexical Attachment:
(i) Lexical encyclopædic content (LEC) is associated with a head in the functional sequence via the lexical element that merges in that position.
(ii) Roots possess category features, but under certain conditions they are allowed to 'under' -attach, leaving some lexical encyclopaedic content (LEC) unassociated to a functional head. In such cases, the category feature must however be syntactically licensed by Agree within the phase.
(iii) Unassociated encyclopædic content can semantically license adjuncts.

The flexibilities built into this system are designed to account for the various argument taking and aktionsartal flexibilities that we find in language, without invoking either multiple homophonous lexical entries, or lexical redundancy rules. The idea is that the syntactic information on the root (i.e. the category features) underspecifies the number of structures that can be built with it, but is still constrained enough to rule out certain impossible forms.

The last main point of the monograph concerns morphology and the crosslinguistic spell-outs of these verbal structures. I have tried to show that even when different languages use different lexical resources, the same syntactic and semantic structuring principles are involved. Specifically, it turns out that English consistently uses 'synthetic' lexical items, i.e. items which bear more than one cate-

gory feature and thus Merge in more than one position (ReMerge). On the other
hand, we also saw the very same structures spelled out by individual pieces of
morphology (Slavic Lexical Prefixes, or Hindi/Urdu causatives), or by separate
analytic pieces (Scandinavian and English Verb-Particle construction, comple-
tive complex predicates in Bengali and Hindi/Urdu). While I do not necessar-
ily claim that there is no important difference between words, morphemes and
phrases within the grammar, I do claim that these differences do not bear on the
syn/sem structures that are being spelled out.

7.2   The Connection to Tense

The verbal decomposition I have been arguing for is logically independent of
tense, and hence of telicity or boundedness per se. However, the nature of the
event built up is a central ingredient to subsequent tense interpretation. Given the
internal causal and topological complexity of events, an important question to ask
is how that complex event is anchored to the speech time which is conceived of
as a single moment. The speech time is the pivotal moment around which tense
relations are defined but whether that speech time is directly related to the inter-
nal dynamic portion of the event, or to its initial or final transitions is a matter
that has been traditionally seen as the domain of Aspect. I will follow this gen-
eral intuition here as well and assume that an aspectual head (or heads) embeds
the eventuality building component of the clause by introducing a time variable
which is anchored in a specific way to the event (as in Giorgi and Pianesi 1997,
Demirdache and Uribe-Etxebarria 2000).

Giorgi and Pianesi (1997) hypothesise that various tenses are the result of a
composition of a relation of the first type with a relation of the second type (table
repeated from Giorgi and Pianesi (1997)).

(97)   Relation 1:   S_R   future   Relation 2:   E_R   perfect

                     R_S   past   R_E   prospective

                     (S,R)   present   (E,R)   neutral

Demirdache and Uribe-Etxebarria (2000) propose a similar system in which
an event time (EV-T) is ordered with respect to an assertion time (AST-T), and
then the latter is ordered with respect to an utterance time (UT-T) (after Klein

(1994)). The former is the analogue of Giorgi and Pianesi's Relation 2 (relating E to R) and the latter of their Relation 1 (relating S to R).

(98) (Adapted from Demirdache and Uribe-Etxebarria (2000))
   (a) [+*Central Coincidence*]: (FIGURE within GROUND)
   Present Tense: UT-T within AST-T
   Progressive Aspect: AST-T within EV-T

   (b) [− *Central*, +*Centripetal Coincidence*]: (FIGURE before/towards GROUND)
   Future Tense: UT-T before AST-T
   Prospective Aspect: AST-T before EV-T

   (c) [− *Central*, +*Centrifugal Coincidence*]: (FIGURE after/from GROUND)
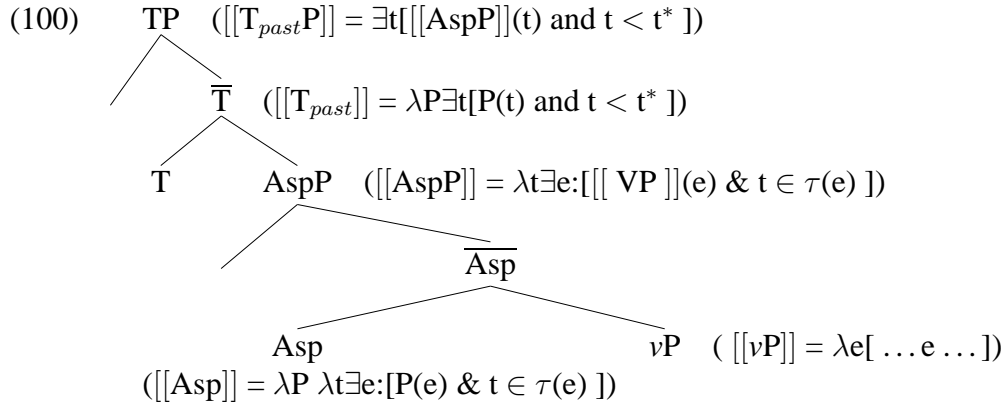   Past Tense: UT-T after AST-T
   Perfective Aspect: AST-T after EV-T

Demirdache and Uribe-Etxebarria (2000) work with intervals as opposed to time instants in this model, and they claim that there is an analogy between tense and aspect relations in terms of the topological configurations they determine. Like Giorgi and Pianesi (1997), D& U assume that the event gives a particular time directly. This is not consistent with the semantics of the first phase argued for in this book, where the *init*P denotes a pure predicate over events. While I agree with the current literature that both an Asp head and a T head are necessary in expressing tense and outer aspect of the clause, giving this idea a slightly different implementation would allow us to maintain the first phase as a domain of pure event structuring, independent of tense. Basically, I assume that the existence of a time variable is provided by the Asp head (Assertion time head) itself. Consequently, the assertion time in D& U's terms cannot be specified as preceding or following the run time of the event, but must somehow be linked integrally to that run time, the complication being that the events in our first phase composition are actually internally complex.

The crucial phase boundary between *init*P and the temporal phrase structural domain requires the establishment of a relation between the extended event topology which makes no direct reference to times, and the actual time variable which is only introduced at Asp. In general we can assume that t and e are related formally by a temporal trace function $\tau(e)$ (as found in Krifka (1992)) which maps an event to the 'time line' that it occupies. In any actual predication, the time variable introduced by Asp will be related in a particular way to the time trace of the event that it embeds. In formal terms, we can represent this restriction as:

(99) t *in* $\tau(e)$ (the reference time of the predication is one of the time moments in the temporal trace function of e)[1]

Assuming that *init*P denotes some predicate over events, the aspectual head combines with it to bind the event variable, introduce t, and to specify the relationship between the two. The actual relationship specified will depend on the particular Asp head. The general property of the Asp head, therefore, is to bind the event variable, and create a predicate over times that are somehow related to that event. The particular content of the Asp head will vary, ranging from very specific conditions on the relation between the time variable and the event, to a very simple minimal condition, as shown in (99) above. Further up the clause, in a completely parallel way, the tense head combines with a predicate over times to bind that time variable and relate it (anchor it) to the speech time in a particular way. The general compositional schema is shown in the annotated tree below (100). For concreteness in the illustration I have chosen a default inclusive Asp head and the T_{past} form.

(100)   TP $([[T_{past}P]] = \exists t[[[AspP]](t) \text{ and } t < t^*])$

$\overline{T}$ $([[T_{past}]] = \lambda P \exists t[P(t) \text{ and } t < t^*])$

T   AspP $([[AspP]] = \lambda t \exists e:[[[VP]](e) \& t \in \tau(e)])$

$\overline{Asp}$

Asp vP $([[vP]] = \lambda e[\ldots e \ldots])$
$([[Asp]] = \lambda P \ \lambda t \exists e:[P(e) \& t \in \tau(e)])$

This system can be used to model many instances of external aspectual operators which were beyond the scope of this monograph[2], I give the phrase structure here for concreteness since temporal and aspectual issues interact with many of the phenomena taken up in this book.

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[1]In this implementation, I am treating the reference time introduced in Asp as a linguistic instant, as is the speech time, although the temporal trace function of the event clearly represents an interval.

[2]But see Ramchand to appear for an analysis of the 'perfective'/'imperfective' contrast in Russian and its relation to prefixation. In fact, the analysis claims that perfectivity (more particularly, the perfectivity diagnostics) are sensitive to the existence of a *definite* event time given by AspP, as opposed to an *indefinite* event time given by AspP.

During the course of this monograph, I argued that there are some general semantic felicity conditions on event-event relationships which bear on how they are eventually anchored to tense.

(101) *Init-Proc Coherence*:
Given a decomposition $e_1 \rightarrow (e_2 \rightarrow e_3)$, e_1 may temporally overlap e_2.

(102) *Proc-Res Coherence*:
Given a decomposition $e_1 \rightarrow (e_2 \rightarrow e_3)$, e_3 must *not* temporally overlap e_2. (although they may share a transition point).

While these conditions are fairly loose, I have argued that they become rigid requirements when the same lexical 'word' identifies multiple subevents.[3]

(103) *Temporal Dependence and Lexical Identification*
Temporal dependence is required for subevents identified by the *same* lexical content.

We saw the notion of temporal dependence and lexical identification at work both in the examination of resultatives in chapter 5, and in the morphological causatives in chapter 6. Here at least is one area in which the nature of the spell-out options have implications for the semantics of the clause and further operations. In general, we found that subevents that were identified by separate analytic pieces had more temporal independence than those that were identified by a single lexical item. The hope is that these generalizations will fall out without stipulation once a precise theory of the relation between tense features on roots and the higher functional structure of the clause is articulated.

It is important to stress that there is no single projection in this system which carries a [+telic] feature. Rather, telicity emerges from a number of different interacting factors. In the absence of secondary aspectual modification, the existence of *res*P does give rise to telicity. Class III, IV, V and VII in the list of English verbs above are default telic and are also punctual because *proc* and *res* subevents are identified by the same root. Class I is telic when the PATH argument is bounded, class VI, when there is an endpoint on the scale of change implied (as in Hay, Kennedy, and Levin 1999).

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[3]I speculate that this intuition can be implemented using a theory of tense feature specification of a lexical item— since one t value needs to be chosen by the Asp head to be linked to the speech time, that t value must be contained in every single subevent that the lexical item identifies.

Telicity is no longer a homogenous concept in this system but arises from the interaction of many ingredients: the existence of a *res* head gives a final bound for a dynamic event; the existence of a *init* head gives an initial bound for a dynamic event and both of these are available for anchoring to tense in principle. In addition, in the absence of a *res* head, a bounded path in the complement position of a process head (whether it be a bounded directional PP, or a quantized DP) can also provide a bound to the event that can be located temporally. If we now reconsider the traditional tests used in English for 'telicity', we can see that they are sensitive to different aspects of this system. The 'in an hour' test measures a time scale leading up to a definite bound or transition. Thus it is grammatical with bounded paths (104c, d) as well as *res*P decompositions (104e,f), but not with unbounded processes (104)a,b.

(104) (a)*Michael drove the car in an hour.
       (b)* Karena danced in an hour.
       (c) Michael walked the trail in an hour.
       (d) Alex ate the mango in ten minutes.
       (e) Ariel ran her shoes ragged in one hour.
       (f) Katherine painted the wall red in an hour.

To the extent that (105a,b) are possible in English, the 'in an hour' measures the time span up to the initiation transition of the event, this being the only transition determined by the event decomposition.

The 'for an hour' test is not the converse of the 'in an hour' test, it seems rather to be a test for the explicit existence of a *res*P. It is sharply ungrammatical only with decompositions that have a *res* either synthetically or analytically (105e,f). Contrary to many claims in the literature (see also Smollett 2005, 'for an hour' is pretty acceptable for most speakers with bounded paths (105c,d). It also seems independently to require some sort of nontrivial duration, so that even a *proc* decomposition is ungrammatical if its PATH complement is phase transitional, as in (105g).

(105) (a) Michael drove the car for an hour.
       (b)Karena danced for an hour.
       (c) Michael walked the trail for an hour.
       (d) Alex ate the mango for an hour.
       (e)*Ariel broke the box for an hour.
       (f) ??Katherine ran her shoes ragged for an hour.

  (g) *Michael drove the car into the garage for two minutes (under the intended reading)

I will therefore assume the following as general diagnostics in English:

(106) (i) 'for X time' incompatible with decompositions that include *res*P, and decompositions without duration;
  (ii) 'in X time' incompatible with decompositions that do not include a final temporal bound.

I have included a discussion of the traditional tests here because of their ubiquity in the literature, and because they do not support some of the more fine grained divisions I have actually argued for in this book. I hope to have shown, however, that notions of telicity based on these common diagnostics are seriously flawed, and conflate event structure boundedness, with aspectual boundedness, and even pragmatic boundedness, if not carefully applied.

More careful investigation of the relationship between event structure and temporal/aspectual structure must await further research.

7.3 Open Questions

There are a number of intriguing issues relevant to this work that I simply have not been able to address in the context of this monograph. First and foremost, the relation between argument structure and case has not been discussed in any deep way. In the recent literature, tantalizing connections have been made between tense and nominative case on the one hand (Pesetsky and Torrego 2001) and aspect and accusative case on the other (Kratzer 2004, Pesetsky and Torrego 2004, Svenonius 2002, Kiparsky 1998, de Hoop 1992). An important further issue for investigation will be to what extent the decompositions proposed here in this book can provide the foundation for a semantically grounded understanding of the structural cases found in natural language. It would have been impossible to do justice to such issues here.

Another issue concerns the unaccusative unergative distinction, which I have generally assumed is real and corresponds to the absence or presence respectively of the *init* head in the first phase decompositions of the two classes. What I have not been able to address systematically is the relation between these structures and the specific diagnostics that have been proposed in the literature for different languages. My intuition is that the diagnostics currently used are as heterogeneous

as the standard telicity tests, and will decompose into being sensitive to slightly different things, once looked at carefully. The hope is that the system of primitive distinctions found in this monograph will be able to make sense of when tests converge and when they interestingly diverge.

Perhaps the most glaring omission in this book has been stative verbs. I have nothing interesting to say about statives, far less the relevant and fascinating relationship between stative verbs, adjectives and participles. Clearly, no theory of verbal decomposition would be complete without addressing these central questions of category and eventuality type.

Many questions remain to be investigated, but I must leave them to further research. As one concrete working out of a constructionalist agenda for argument and event structure, I hope that this book can provide a useful starting point for deeper investigation.

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