

GRAMMATICALIZING ASPECT AND AFFECTEDNESS

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# Grammaticalizing Aspect and Affectedness

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Carol Lee Tenny

Submitted to the Department of Linguistics and Philosophy  
on August 24, 1987 in partial fulfillment of the requirements  
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## ABSTRACT

This thesis is an investigation of the interaction of aspect and syntax. More particularly, the syntactic repercussions of the aspectual property of delimitedness are examined. Delimitedness -- the temporal boundedness of an event -- is shown to have an effect on a wide range of syntactic phenomena, including resultative secondary predicates, verb-particle constructions, and certain case phenomena. Affectedness is also shown to depend on delimitedness. The interaction between affectedness and syntax is proposed to take place in the Case module of the grammar.

An analysis of the property of affectedness in aspectual terms leads to a theory in which the direct argument of a verb 'measures out' the event described by the verb over time, as if on a scale. Affected arguments are direct arguments that delimit the event on that scale. Non-affected direct arguments also 'measure out' the event, though they do not delimit it.

This aspectual property of direct arguments is the first of a set of aspectual principles of argument structure. Three additional principles are proposed: An event may be delimited only by its internal arguments -- arguments within the verb phrase at deep structure. Indirect arguments may delimit the event parasitically through the direct argument, while external arguments may not delimit the event at all. Secondly, there may be only one 'delimiting' to a verb phrase. And finally, secondary objects are always delimiting elements.

Two specifically syntactic issues are addressed. First, it is proposed that aspect is a syntactic category, and several possible instantiations of aspect in phrase structure are discussed. Secondly, the aspectual principles of argument structure are applied to verb-particle constructions, resultative secondary predicates, and double object constructions; and these principles are shown to shed some light on the syntactic behavior and structure of these constructions. The usefulness of aspect as a tool for syntactic investigations is demonstrated.

The aspectual principles of argument structure place constraints on the kind of event participants that can be internal arguments. In this way these principles provide a principled mapping between the 'meaning' of verbs and their syntactic representations. The Aspectual Interface Hypothesis is proposed, which maintains that the two systems 'communicate' only through a common aspectual vocabulary. Under this view only the aspectual information in thematic roles is visible to the syntax, and thematic hierarchies are not necessary in the mapping between 'meaning' and syntax. The Aspectual Interface Hypothesis is consonant with a highly autonomous syntax.

Thesis Advisor: Dr. Kenneth Hale  
Title: Ferrari P. Ward Professor in Linguistics

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"Anybody knows that if you believe what we tell you here  
it's your own fault."

-- Morris Halle

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## Chapter 1. Introduction

### 1.1 Introduction

This thesis is an investigation of aspect and its interaction with syntax. More specifically it concerns one aspectual property, delimitedness, and the role it plays in syntax. Delimitedness -- the property of an event's being bounded in time -- is a semantic property, but it is implicated in a wide range of syntactic phenomena. Although there are other aspectual properties of events that are grammaticalized in many languages, delimitedness is the one that has the most repercussions in syntax. The delimited/non-delimited distinction seems to be a central aspectual property of natural languages.

Aspect has long been recognized as a topic worthy of interest to linguists outside the generative tradition, and particularly among students of Slavic languages, where it is heavily represented in the morphology. But aspect has not been treated in generative theory in any great depth, because its interaction with general principles of grammar has not been understood. The nature of that interaction will be elucidated in this thesis, and it will be proposed that delimitedness interacts with NP-movement, with Case, and with the syntactic organization of argument structure.

'Affectedness', a property of arguments which has been

discussed in the literature recently, has been linked with many seemingly unrelated syntactic phenomena. The semantic property of 'affectedness' plays a significant role in predicting some kinds of syntactic behavior; but why 'affectedness' should do this, or how to understand 'affectedness' in syntactic terms, has not been clear. It will be demonstrated in this thesis that 'affectedness' is properly defined in terms of delimitedness. This will not answer all questions about the syntactic effects of 'affectedness' but it will provide a framework for understanding and investigating the phenomenon of affectedness further.

In a deeper sense, this thesis is about the connection between syntax and semantics. Aspectual delimitedness and affectedness are two semantic properties that have syntactic effects. In a theory of language espousing the autonomy of syntax, these are interesting properties, particularly worthy of study. This investigation will lead to a view in which aspectual properties mediate between lexical semantics and syntax in a highly constrained way. This view allows a strong version of the autonomy of syntax to be maintained, and uncovers the tools with which an explicit theory of thematic roles could be developed. The interface between syntax and lexical semantics or cognitive structure is to be found in the correlation between certain aspectual properties and deep structure argument positions. In particular it will be

proposed that the direct argument 'measures out' the event described by the linguistic expression. Much progress has been made in generative grammar by searching for the maximum connection between syntax and semantics. I follow that tradition here.

English is the principle language investigated in this thesis, although reference will be made to relevant data in other languages. The work is couched, for the most part, in the syntactic framework of Government and Binding Theory, but I have no doubt that many of these insights could be captured in other frameworks. The semantic discussions will be cast in informal terms. Some words with technical usages will be used informally; these include 'event', 'measure', and 'meaning'. The reader will be alerted to the usages of these words in the course of the discussions. Also, the symbols A and E will be used in place of the standard symbols for the universal ( $\forall$ ) and existential ( $\exists$ ) quantifiers.

Chapter 2 presents some of the range of syntactic phenomena in which delimitedness is implicated. Chapter 3 discusses 'affectedness'; argues that it is an aspectual property based on delimitedness; and makes some proposals about how affectedness is hooked up to syntax. Chapter 4 investigates the aspectual properties of internal, external and oblique arguments, and proposes some general principles of argument structure. Chapter 5 digresses slightly in posing and

considering two syntactic questions upon which aspect has some bearing: the place of aspectual markers in X-bar theory, and the deep-structure constituency of double object constructions. Finally, Chapter 6 advances the idea that aspectual properties of argument structure mediate the connection between syntax and lexical semantics or cognitive structure.

## 1.2 Aspect

'Aspect' usually refers to the organization with respect to time, of an event represented by some linguistic expression such as a verb, verb phrase, clause or sentence. This includes such things as whether the event is understood to involve change over time, whether it has a definite endpoint or is ongoing in time, whether or not it is repetitive, and so on.<sup>1</sup> Many languages have morphological markers indicating this kind of information. English has relatively little aspectual morphology, but one example it provides is the progressive form, marked by 'be -ing'. The progressive characterizes an event as ongoing, even though the same verb without the progressive marker may describe an event that has an endpoint in time. For example, the sentence,

---

1. For general discussion of the kinds of aspectual phenomena found across languages, see Comrie (1976) and Timberlake and Chung (1985).

1  
Patricia climbed a tree.

describes an event as having an endpoint. The sentence describes the event as lasting a certain length of time. We can tell this because it is possible to say:

2  
\*It took Patricia an hour to climb the tree.

However, when the verb is in the progressive form the event is described as if it had no particular duration or endpoint:

3  
Patricia was climbing the tree.  
It took Patricia an hour to be climbing the tree.

Morphological markers of aspect such as 'be -ing' manipulate the temporal organization of the event described by the verb.

Aspect in the example above is signalled by a morphological marker on the verb, but this is not always the case. There is a large body of aspectual information that is inherent in the verb itself, or conveyed by the interaction of the verb with its arguments. For example, the expression 'climbing a tree' describes an action that has an endpoint built into it, but 'pushing a cart' does not. 'Winning the race' and 'growing up' are both predicates that describe actions with an end, but 'winning the race' describes something that occurs in an instant, whereas 'growing up' names an event that takes years. This kind of information must be included in the lexical entries of these verbs. Distinctions such as these

have been discussed in a long tradition of linguistic and philosophical literature dating back to Aristotle, and will figure greatly in this thesis. These phenomena are referred to as Aktionsarten in much of the linguistic literature. Many authors have classified verbs and/or predicates according to whether they describe events that happen instantaneously or over a period of time (the momentary/durative distinction); whether they involve achievement of an end or not (the telic/atelic distinction); and whether the predicates are stative or nonstative. Some authors classify verbs alone into aspectual classes, others classify entire verb phrases. The aspectual property of delimitedness investigated in this work will be shown to be compositional -- a property of verb phrases or sentences rather than of lexical items. It is a property determined by the interaction of a verb and its internal arguments. Delimitedness is the property of a linguistically described event which is bounded in time. The distinction between delimitedness and non-delimitedness is close to the telic/atelic distinction.

Aspect is generally distinguished from tense in that tense makes reference to a moment in time determined by the context in which the expression is used -- the 'present', for example, or the time at which the linguistic expression is uttered; 'aspect' does not refer to such contextual information which locates the event in time, but to the internal time of the event. Events as they are expressed linguistically have

temporal structure independent of reference -- this is what 'aspect' refers to. Tense, on the other hand, is indexical; i.e., it is interpreted partly through the context in which it is used.<sup>2</sup> The English markers of present, past and future mark tenses.<sup>3</sup> If we say "Patricia is tall", the state of Patricia's being tall is related to a particular point in time -- the time at which the sentence is uttered. If we say "Patricia will climb a tree", or "Patricia climbed a tree" we express the event as taking place at some moment before or after the present moment. The working definition I adopt of the difference between tense and aspect is as follows: tense must be interpreted partly through extragrammatical

-----

2. There are three general approaches to a theory of tense in the literature. Reichenbach (1947) established a method of capturing the possible range of interpretations of various tenses by setting up three reference points of time. These are the speech time, (or time at which the sentence is uttered); the event time, (or time the event actually takes place); and the reference time (an internal time relating speech and event time in some tenses). This system is widely used and referred to by subsequent authors, among them, Smith (1978) and Hornstein (1977), who extend and adapt the Reichenbachian approach to a larger corpus of data. McCawley (1971) treats tenses as underlyingly verbs, successively embedded in a clause. Each embedding of a tense predicate alters the sentence's reference to time. Finally, Partee (1973) treats tense as a binding phenomenon. Partee notes striking similarities between the behavior of tenses and pronouns, and proposes that tenses are bound variables. All of these theories address the relation of the time-reference of events directly or indirectly to a time line, or to other events.

3. The English future is indicated by a modal rather than by a tense marker, but for present purposes the English future acts as a tense.

information; aspect is determined through information contained within the linguistic expression.<sup>4</sup>

Although tense and aspect are interdependent in certain ways, I will abstract away from this interdependence and investigate aspect as independent of tense.

The term 'aspect' in its traditional usage refers to a broad range of effects, generated by various parts of the language including tense, morphological aspectual markers, adverbial expressions, lexical meanings of predicates, and the syntactic or semantic nature of their arguments. Aspect as such may not be a unified phenomenon, and perhaps should not be treated as one system. I do not intend to address in this thesis the wide range of aspectual phenomena discussed in the literature on aspect. Instead, I focus on one aspectual property, which I label 'delimitedness', and which I demonstrate is of fundamental importance in syntax and in cognitive or thematic

-----

4. The distinction between tense and aspect is not always clearly maintained in the literature on the subject. The English perfect, for example, is sometimes treated as a tense and sometimes as aspect. It has often been classed as aspectual because it seems to impose a completion on the event described. (In the sentence, "Patricia had climbed a tree", the tree-climbing is related to the present moment by mediation through some unspecified moment in the past, before which the event occurred.) Reichenbach (1947) treats the perfect forms as tenses and subsumes them elegantly in his system of tense semantics. Syntactically, at least there is reason to class the perfect forms with aspect. I return to the English perfect briefly in Chapter 5, but apart from that, the perfect forms will not be discussed in this thesis.

structure. I hold delimitedness to be one of the crucial parameters of aspect, perhaps even the central parameter. A general investigation of a wider range of aspectual phenomena is beyond the scope of this work, but it is partly my thesis that investigation of delimitedness will shed light on other kinds of aspectual phenomena as well. Some predictions about aspect in general, made on the basis of this investigation into delimitedness, may have to await further research to be fully tested.

### 1.3 Delimitedness

In light of the general discussion of aspect above, I turn now to discuss the particular property of delimitedness which is the topic of investigation of this thesis. Delimitedness refers to the boundedness over time of an event as described by a linguistic expression. A linguistically described event is delimited if the sentence describes an event as something that must transpire over a fixed length of time. It does not matter whether that length of time is indicated in the sentence. The sentence or event is delimited if it is understood to mean that there is some point in time after which the event is no longer continuing. I will illustrate this in a general way through four classes of examples.<sup>5</sup> For

-----  
5. It is my purpose to use delimitedness as a tool for linguistic investigation. To this end it suffices if I demonstrate that the speaker's intuitions, supplemented or

example, the sentence below describes an event of some duration having a definite temporal endpoint. (These are referred to as accomplishments.)

4  
Kim will climb the silo.

The event described, Kim's climbing of the silo, is one that must come to an end when he reaches the top of the silo. That may take three minutes or three days, but if he climbs the silo it will take a finite definite length of time.<sup>6</sup> Now compare 4 above with a sentence that describes an event of indefinite duration. (These are referred to as activities.)

-----  
confirmed by certain independent tests, are adequate to determining whether a linguistic expression describes a delimited or non-delimited event. It is not my goal to provide a formal treatment of delimitedness, or define it within any formal system.

6. Delimitedness may seem to depend, in 4, on world knowledge as well as on purely linguistic information. The delimitedness of the climbing depends on the silo having finite length. A certain class of verbs, to which 'climb' belongs, translates spatial delimitedness into temporal delimitedness. Nevertheless, the delimited interpretation of the sentence would seem to depend on grammatical factors, rather than on contextual information. First of all, the fact that this verb can do that is linguistic information, contained in the lexical entry for the verb. Secondly, in languages where delimitedness is marked morphologically the delimited reading would necessitate a finite silo, of which the entirety is climbed once. Although delimitedness is not morphologically marked in English, the delimited reading is available as a grammatical option, even when not marked by morphology. I will leave further investigation of this problem for future research.

5

Kim will sleep in the silo.

The event described, Kim's sleeping, will not have a definite duration; in fact, it need not even be finite. Kim may sleep three minutes or three days or forever -- the sentence expresses no restrictions on how long Kim sleeps.

Certain sentences expressing events that have little or no duration in time, may also be delimited. (These are known as achievements.) The following sentence is an example:

6

Kim will spot that sheep by the river.

6 describes a short-lived event. But even if it only takes a moment to spot the sheep, there will be some definite moment in the course of such an event, when sheep-spotting has come to an end.

Sentences constructed with stative predicates describe situations that are not delimited:<sup>7</sup>

7

Kim likes sheep.

Sentences like 1 and 3 which describe events as having a

-----

7: Statives, strictly speaking, are better characterized as describing situations that are independent of temporal duration. We return to this in Chapter 4. For present purposes statives can be considered to express events having indefinite temporal duration.

finite or definite duration over time I will refer to as describing delimited events. Sentences such as 2 and 4 which describe events without a definite temporal endpoint describe non-delimited events. These four classes of linguistic expressions or linguistically described events are summarized in the chart below. The classes were devised by Vendler (1967).

Accomplishment	definite duration of some length	delimited
Achievement	having a definite endpoint, but of very brief duration or no duration	delimited
Activity	indefinite duration	non-delimited
Stative	indefinite duration	non-delimited

Two points of clarification are in order. It must be made clear that though I speak of events being delimited, it is not actually the event, but the linguistic representation of the event that is delimited. I do not intend to make any claims about the nature of events in the world, only about the representation of events in natural language. It is very possible that the linguistic expression of events is related to the cognitive perceptions of events by human beings, but I make no claims about this either. Referring to the delimited or non-delimitedness of events is simply a convenient shorthand I will employ for referring to the delimitedness of events as they are structured, represented or expressed by

natural language. I am making a three-way distinction between (i) the linguistic expression, (ii) the event as represented by that linguistic expression, and (iii) some event in the world. I do not intend to make any claims about the (iii), or discuss the relation between (ii) and (iii). Secondly, for brevity and convenience, the term 'delimited' may be applied to sentences or verb phrases that describe an event as bounded in time, even though it is the linguistically expressed event itself that is delimited, rather than the linguistic expression.

Delimited and non-delimited sentences can be distinguished by certain tests; in particular, by the application of durative adverbials.<sup>8</sup> Non-delimited activity and stative sentences are completely acceptable with the durative adverbial, under the interpretation that the event happened only once during the time span expressed by the adverbial. (This will be referred to as the semelfactive reading.)

8  
Kim slept for three hours.

9  
Kim liked sheep for three years. (Then he got bitten by one.)

These sentences describe a single event of sleeping or sheep-liking. They do not describe a succession of such

-----

8. Tests for aspectual classes using adverbial expressions are discussed by Dowty (1979) and Vendler (1967), among others.

events. When durative adverbials are applied to a sentences describing delimited events, the sentence either must be, or may be, interpreted to mean the event happened again and again during the span of time indicated by the adverbial. (This will be referred to as the iterative reading.)<sup>9</sup>

10

Kim spotted that sheep for three hours.

11

Kim climbed the silo for three hours.

The sentences above describe delimited events. 10 cannot mean that Kim spotted the sheep only once over the course of the three hours. It must be interpreted to mean that the sheep was spotted many times, or else it makes no sense. Sentence 11 may be understood to mean that Kim climbed the silo again and again over three hours' time.<sup>10</sup>

-----

9. If the sentence is understood to express an event happening over and over an indefinite number of times, the sentence expresses something with an indefinite duration in time. The property of delimitedness as defined here is based on the semelfactive reading and not on the iterative reading. Sentences 10 and 11 are delimited sentences, even when they are given an iterative reading.

10. Some speakers find that some sentences describing events having duration as well as delimitedness, may have another reading besides the iterative one: i.e., 11 might be understood to mean that it took Kim three hours to climb the silo once. When this reading is available, the sentence is not a true accomplishment, but has more of an activity sense to it. An appropriate paraphrase would be, 'for three hours Kim was engaged in the activity of climbing the silo'. Another example suggested to me by Steven Abney is a sentence used by a mother to address her child on a playground, climbing up and down on the play equipment: "You've climbed

When an adverbial expression like 'in an hour' is applied to a non-delimited expression, the sentence is odd:

12  
?Kim slept in an hour.

13  
?Kim liked sheep in three years.

However, an 'in' adverbial applied to a delimited expression is perfectly natural:

14  
Kim climbed the silo in three hours.

15  
Kim spotted that sheep in three hours.

In short, certain durative adverbial expressions are diagnostic of delimited or non-delimited events: 'for' adverbials with a semelfactive reading indicate non-delimited events; 'for' adverbials with an iterative reading indicate delimited events; and 'in' adverbials indicate delimited events.

To summarize,

16  
An event is delimited iff there is some point of time during which the event transpires, but after

-----  
Mt. Everest long enough. Let's go home." The conditions under which a semelfactive reading of a delimited expression is possible are not yet clear to me. For present purposes this does not invalidate the test, since it depends on the possibility rather than the necessity of an iterative interpretation.

which the event is no longer transpiring. If the state p is a state in which the event is transpiring, and the state -p is a state in which the event is not transpiring, then for a delimited event there is some point of time when p becomes -p.<sup>11</sup>

Choosing the property of delimitedness to investigate, out of the wide range of phenomena included in the term 'aspect', calls for some justification. First of all, delimitedness has been recognized in the literature as a central property of aspect. What I have called the delimited/non-delimited distinction is comparable to what has been called in the literature the event/process, non-durational/durational, telic/atelic, and definite/indefinite-change-of-state aspectual distinctions described in the literature. (For a more extensive discussion of this point and of the literature on the subject, see the Appendix to this chapter.)

Secondly, delimitedness has been recognized as one of two salient properties whose definition is necessary for a discussion of lexical aspect. The other property -- the durational vs. instantaneous quality of a linguistically described event -- is arguably of less grammatical importance than the delimited/non-delimited distinction.

The difference between accomplishments and achievements is

-----

11. The term 'event' is used loosely and intuitively here to indicate a situation or happening described by a linguistic expression.

one of duration. Accomplishment events have duration; achievement events last only for a short interval or a moment (if it is appropriate to describe them as 'lasting' at all). However, many achievement verbs are easily reanalysed as accomplishment verbs if one has the imagination to construct a situation in which the achievement would take time. Dowty (1979) pointed this out with the achievement verb, 'die'. Dying is something that generally takes only a moment, but one may occasionally say such things as, "the old man finished dying", (Dowty's example) which indicates that the dying had some duration. <sup>12</sup> <sup>13</sup> In other words, imagination and pragmatic knowledge can affect whether a verb is interpretable as an achievement or an accomplishment verb. We would not expect a purely grammatical distinction to be accessible to such extra-grammatical factors as these.

The delimited/non-delimited distinction is quite different.

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12. The conditions on the use of the English progressive are more complicated than implied here. These include other requirements on the event described besides duration. In this thesis I do not discuss these conditions in any detail, and I do not use the English progressive as a final diagnostic for any aspectual property.

13. M. Halle has pointed out the following Russian proverb:

ne trudno umeret'  
it is not difficult to die-PERF

no trudno umirat'  
it is difficult to die-IMPERF

"It is not difficult to die, but to be dying."

There are verbs that can belong to both the class of verbs that are associated with delimited events, and the class of verbs that are associated with non-delimited events. In the author's dialect `dry', as in `dry the clothes', is such a verb. Drying the clothes can mean something one effects (delimited or accomplishment reading), or it can mean something one does, that takes an indefinite length of time (non-delimited or activity reading). The verb `die' has a salient reading as an achievement verb, but the application of some imagination makes the accomplishment `meaning' available, in English as well as in Russian. Pragmatic knowledge about dying contributes to the interpretation of the verb as an achievement. In the case of `dry' no pragmatic information biases one towards a delimited or non-delimited reading of the verb, nor does imagination suffice to make us choose the non-salient reading. The delimited/non-delimited distinction is freer of pragmatic influence than the durative/non-durative distinction.

Finally, the durative/instantaneous distinction does not correlate with the wide range of grammatical/syntactic phenomena that delimitedness does. Nor, to the best of my knowledge, is the durative/non-durative distinction grammaticalized in the morphology of any language, in such a way that there is a particular morpheme that converts achievement verbs into accomplishment verbs or vice versa. Such morphemes do exist in many languages to mark the

delimited/non-delimited distinction. The wide range of grammatical and syntactic phenomena that must be stated in terms of delimitedness will be demonstrated in Chapter 2.

## APPENDIX: Overview of literature on aspectual verb classes

This appendix is a brief survey of literature on aspectual verb classes. Although a variety of approaches to a taxonomy of lexical aspect have been proposed, they all pick out the same or nearly the same properties as primitives. Something like delimitedness is an important feature in all these systems.

The earliest taxonomy of verb aspect cited in the literature is Aristotle's. Aristotle discussed the differences between logical entailments of various verbs with regard to tenses. He was the first to point out that verb classes can be distinguished depending on whether the sentence 'we are VERBing' implies 'we have VERBed'. Aristotle discusses a distinction in logical entailments between language describing events that come to an end and language describing events that have no definite endpoint: (Aristotle, Metaphysics 1048b, trans. H. Tredennick)

...at the same time we see and have seen, understand and have understood, think and have thought; but we cannot at the same time learn and have learnt, or become healthy and be healthy. We are living well and have lived well, we are happy and have been happy, at the same time; otherwise the process would have had to cease at some time...; but it has not ceased at the present moment: we both are living and have lived.

The philosophical literature has taken up this problem more recently. Kenny (1963) developed a trichotomy of verb types based on ideas of Aristotle's in the De Anima, Metaphysics and

Nicomachean Ethics, distinguished by the entailments of verbs in present and past tenses. Ryle (1949) distinguished verbs describing events which happen at a particular instant and end in a particular result, (which he called achievement verbs) from those which do not (task verbs). His distinction opposes achievement/task pairs like 'cure' (which describes an event having a temporal endpoint) and 'treat' (which describes an event ongoing in time).

By and large the recent generative linguistic literature looks to Zeno Vendler for the first discussion of this problem. Vendler (1967) divided verb phrases into four classes according to the type of events they describe: activities, accomplishments, achievements and states. Activities are ongoing events like 'running', 'swimming' or 'pushing', which call for an indefinite period of time. There is no terminal point when the activity must come to an end. One may ask about the duration of an activity: "For how long did she push the cart?" Accomplishments have a definite terminus, as in 'drawing a circle' or 'making a chair'. They transpire over a unique, definite period of time, and must be questioned accordingly: "How long did it take to draw the circle?" Achievements, like 'recognizing his face' or 'reaching the summit', have a terminus but happen instantaneously and so are to be distinguished from accomplishments, which have duration. One must ask about an achievement, "At what time did you reach the summit?"

Finally, statives such as 'knowing the answer' are ongoing in time. The progressive form is a criterion used in Vendler's classification. It distinguishes activities and accomplishments from states and achievements:

16

I am running.	(activity)
I am making a chair.	(accomplishment)
*I am recognizing his face.	(achievement)
*I am knowing the answer.	(stative)

Vendler set up this four way classification scheme using the presence or absence of an event terminus, the momentary or durative quality of the event, and the applicability of the progressive form.

Subsequent aspectual classification systems in the linguistic literature are based on Vendler's work. Various authors have adapted or redefined Vendler's scheme according to their own views. They have generally selected the presence or absence of an event terminus -- the telic/atelic distinction -- as the important parameter of aspect. Mourelatos (1981) set up a trichotomy in which accomplishments and achievements are grouped together as 'events' in opposition to activities, which he calls 'processes'. States are distinguished from all of these. Verkuyl (1972) mentioned the tripartition into activities, accomplishments and achievements (which he called the durative, terminative and momentaneous aspects, respectively) but he focused his

research on the opposition between non-durative and durative aspect -- again the telic/atelic distinction. Hinrichs (1985) is also based on an analysis of the telic/atelic distinction.

Dowty (1979), in a thorough treatment of aspectual classes of English verbs, worked out an aspect calculus involving partial lexical decomposition of verbs. It provides a system of representation for the Vendler classes. This was part of a larger program to illustrate the value of lexical decomposition, based on the generative semantics tradition, but couched in a Montague-type model-theoretic semantics. In Dowty's system, stative predicates are the primitives out of which other predicates are formed through combination with primitive logical operators of a natural logic. Achievement verbs are represented by the logical operator BECOME applied to a stative predicate. BECOME(p) is defined (loosely) as: "first not p and then p" or: "the state p comes about". This captures the intuition that achievement verbs describe an instantaneous change of state. The achievement verb "discover" in the sentence "John discovered the buried treasure in his back yard", is roughly:

17  
BECOME[John knows that...]

Accomplishments contain the logical connective (p)CAUSE(q) joining two embedded sentences. (For arguments motivating the bisentential analysis see Dowty (1979).) The accomplishment

sentence "John painted a picture" has a structure something like:

<sup>18</sup>  
[[John paints] CAUSE [BECOME[a picture exists]]]

Activity predicates contain an operator DO applied to a stative predicate. This is intuitively satisfying since agentivity or volition often distinguishes many activity verbs from statives. (e.g. Compare stative and active forms of "taste" as in "This orange tastes good" and "John tastes the orange".) The verb "look" in "Mary looks" would be roughly:

<sup>19</sup>  
DO (mary [see...])

(Dowty acknowledges, however, that the operator DO is not as well-motivated as the operators BECOME and CAUSE.) Not every stative predicate appearing in these semantic representations need be lexicalized in the language. The logical operators BECOME, CAUSE and DO may appear in the semantic representations of other verb classes besides the ones they are primarily associated with, but in general they take wide scope in their respective classes.

Dowty later introduces an interval semantics, in which the primitive unit of time is taken to be the interval rather than the moment. Redefining BECOME(p) with truth conditions using time intervals, Dowty united achievement and accomplishment

verbs by ascribing to them both the operator BECOME. He refined Vendler's classification by setting up five distinctions determined by syntactic tests. These yield the classification system reproduced in the table below (from Dowty (1979) p. 184).

	Non-agentive	Agentive
States	1a. be asleep, be in the garden love, know  1b. interval statives: sit, stand, lie	2a. be polite, be a hero (these belong possibly here or in 4)  2b. interval statives sit, stand lie (with human subject)
Activities	3. make noise, roll rain	4. walk, laugh dance (cf.2a)
Single change of state	5. notice, realize; ignite	6. kill, point out (something to someone)
Complex change of state	7. flow from x to y dissolve	8. build (a house) walk from x to y, walk a mile

The distinctions and syntactic tests used for determining these classes are quoted below from Dowty (1979):

- I. Momentary (1a and 'habituals' in all classes) vs. interval predicates (1b, 2b, 3-8). Syntactic test: ability to appear in the progressive. (Note: 6 and especially 5 appear less readily in the progressive than other interval predicates.)
- II. Predicates entailing definite or indefinite change (3-8) vs. those entailing no change (1 and 2).

Syntactic test: ability to occur in do constructions (pseudo-clefts, do so reduction, etc.)

- III. Definite change of state predicates (5-8) vs. activity predicates or indefinite change of state predicates (3 and 4). Syntactic test: Does x was V-ing (pragmatically) entail x has V-ed?
- IV. Singularly change predicates (5-6) vs. complex change predicates (7-8). Syntactic test: Is x finished V-ing acceptable?
- V. Agentive (2,4,6,8) vs non-agentive (1,3,5,7) predicates. Syntactic test: ability to occur in agentive contexts like imperatives, persuade x to do V, do V deliberately, etc.

Note that in III above, accomplishment and achievement predicates are united as "definite change of state predicates" while activities are "indefinite change of state predicates". This roughly corresponds to what Mourelatos called the 'event/process' distinction, Verkuyl called the 'non-durational/durational' distinction, and traditional literature refers to as the 'telic/atelic' distinction. Dowty's definite change of state predicates are divided into four classes as opposed to Vendler's two classes of accomplishment and achievement verbs. However, the distinction between singularly change and complex change predicates has smaller scope than the distinction between definite and indefinite change predicates. Like Mourelatos, Verkuyl and Hinrichs, Dowty selected this parameter as a crucial parameter of aspect.

In acknowledging the work of previous authors I have introduced much confusing terminology. I have bypassed this

confusion by abandoning all the terms used to describe these phenomena, together with the question of whether these various authors meant exactly or only approximately the same thing. The aspectual distinction investigated in this work is non-delimitedness vs. delimitedness. It is roughly comparable to the event/process, non-durational/durational, telic/atelic, and definite/indefinite-change-of-state aspectual distinctions described in the literature.

## Chapter 2. The Grammatical Reality of Affectedness and Delimitedness

Delimitedness has been defined in Chapter 1 as a property of events which have a definite duration over time. It is an aspectual or semantic property rather than a syntactic one. Nevertheless certain syntactic behavior is determined by this property. The same thing is true of affectedness, another semantic property related to delimitedness, which has substantial repercussions in syntax. These are two semantic properties that must be defined in the grammars of natural languages. They have grammatical reality because there are syntactic phenomena for which the correct generalizations cannot be stated without reference to delimitedness. A few of these are discussed in the following sections.

### 2.1 English verb-particle combinations

English has a large number of partly lexicalized verb-preposition combinations. 'Think through', 'shut up', 'look over', 'throw out', and 'rely on' are a few examples. A sub-class of these constructions are known as verb particle constructions. These have been discussed by Bolinger (1971) and Fraser (1976) among others. These particles exhibit the syntactic trait of being able to appear on either side of the object noun in transitive expressions. Bolinger (1971) used this characteristic to distinguish them from what he called pure prepositions, which may only appear before the noun, and

pure adverbials, which only appear after it. These three classes are illustrated below in 1a, 1b, and 1c respectively. (Examples are from Bolinger (1971). He refers to these particles as adverbial particles.)

1

a.

run up the flag  
run the flag up

He looked up his friends.  
He looked his friends up.

They bought out their competitors.  
They bought their competitors out.

b.

climb up the tree  
\*climb the tree up

I can cope with Jones  
\*I can cope Jones with.

c.<sup>1</sup>

\*I left there the keys.  
I left the keys there.

I saw John yesterday.  
\*I saw yesterday John.

\*He sold regretfully the business.  
He sold the business regretfully.

With pronominal objects, the particles appear in the postnominal position, which makes the difference between particles and pure prepositions more pronounced:

-----

1. Heavy NP Shift may apply in the adverbial cases. Bolinger presents the example, 'I would sell regretfully any business in which I had been engaged for half a lifetime.'

2

a.

\*run up it  
run it up

\*He looked up them.  
He looked them up.

\*They bought out them.  
They bought them out.

b.

climb up it  
\*climb it up

I can cope with him  
\*I can cope him with.

The ordering of particles and pronominal objects is readily explained by a condition that requires the item with the heaviest 'weight' to be clause-final where possible. The heaviest 'weight' is associated with the most or the newest information, or with the longest utterance. When the pronominal is stressed it can be ordered postnominally:

3

You looked up THEM?! Those were the wrong ones to look up!

In this way, the ordering of particles with respect to pronominal objects is related to Heavy NP Shift, which is known to be a stylistic rule. The syntactic generalization that the particle may appear on either side of the object holds true, where the effect of stylistic or discourse conditions is controlled for.

The degree of idiomaticization of a verb-particle

combination influences the separability of the verb and the particle. Highly idiomaticized combinations are less likely to be separable from the verb: 4a may be interpreted in the literal or the figurative sense, but 4b may only be interpreted in the literal sense.

4

- a. Don't throw up your lunch.
- b. \*Don't throw your lunch up.

The data above show that there is a class of particles which may occur on either side of a direct object noun phrase, and which preserve a somewhat literal sense. These particles also have a particular semantic property; they impart a resultative sense to the sentence or verb phrase. In Bolinger's words, "the particle must contain two features, one of motion-through-location, the other of terminus or result."<sup>2</sup> Bolinger notes that manner and time adverbials are excluded by this account, as are place and stance adverbials (which may contain result without motion), and directional adverbials (motion without result). These are illustrated in 5a, 5b and 5c respectively:

5

- a.
  - \*He built well the fire.
  - \*She stitched carefully the rip.
  - \*I bought yesterday the stocks.

-----

2. Bolinger (1971) p. 85

- b.  
 \*We brought here the bags.  
 \*I left home the money.  
 \*She crooked akimbo her arms.

- c.  
 \*He tossed upward the ball.  
 \*They pulled downward the blinds.

An event that achieves a result is an event with a temporal endpoint -- a delimited event.<sup>3</sup> The class of verb particles have the semantic property of imposing delimitedness on the event described by a verb phrase or sentence, as well as the syntactic property of appearing on either side of the noun phrase object:

6	
look up a name in the phonebook	(delimited)
look a name up in the phonebook	(delimited)
look over an article	(delimited)
look an article over	(delimited)
think up an answer	(delimited)
think an answer up	(delimited)
think through a problem	(delimited)
think a problem through	(delimited)
sit out a game	(delimited)
sit a game out	(delimited)
eat up an apple	(delimited)
eat an apple up	(delimited)

-----

3. Not all expressions that have to do with the results of an event are delimiting; e.g. purpose clauses. The sentence 'John sang in order to surprise Bill' describes a non-delimited event, even though it contains a purpose clause. Purpose clauses do not represent a result as achieved; hence their inability to delimit.

If I 'look over an article' or 'think up a result' my action of looking or thinking has a clear result or termination. The article has been perused; there is an answer that did not exist before. Either the object itself has been changed or the activity has progressed through the 'extent' of the object itself during the course of the event.

Prepositions which do not require a delimited interpretation do not demonstrate the syntactic behavior of particles:

7		
look at a photograph		(non-delimited)
*look a photograph at		(non-delimited)
look out a window		(non-delimited)
*look a window out		(non-delimited)
think about a problem		(non-delimited)
*think a problem about		(non-delimited)
sit on an idea		(non-delimited)
*sit an idea on		(non-delimited)
sit on a chair		(non-delimited)
*sit a chair on		(non-delimited)
eat at an apple		(non-delimited)
*eat an apple at		(non-delimited)
put on an act		(non-delimited)
*put an act on		(non-delimited)

Prepositions introducing goal phrases generally require a delimited interpretation, but they do not express a result in the same way that particles do, and they do not exhibit the syntactic behavior of particles:

fly to the moon  
walk to the cliff

(delimited)  
(delimited)

Although the events expressed by these verb phrases are delimited events, having a distinct temporal endpoint, the endpoints are not reached by either changing or 'traveling through' the objects, moon and cliff. After looking up a name, the name is in some sense 'up', (facetiously speaking) but the moon is not 'to'. Particles have a special semantic relationship with the direct object, not shared by goal phrase prepositions such as 'to'.

Particles impart a sense of result. They force a delimited interpretation of the event described, and they may appear on either side of the object NP. Particles constitute an aspectual class of words with a particular syntactic behavior. Whatever the proper analysis is of the syntax of these particles, some reference must be made to their aspectual nature, or an important generalization has been missed.

## 2.2 English resultative secondary predicates

Certain syntactic differences between resultative and depictive secondary predicates have been noted in the literature. Authors who have written on this subject include Halliday (1967), Rothstein (1979), Simpson (1983), Carrier-Duncan and Randall (1987), and Hale and Keyser (1987). The observations in this section are drawn from their

work.

Resultative predicates are similar to particles except that they may be adjectives or prepositional phrases. Resultatives are underlined in the sentences below. (Examples 9 through 12 are from Hale and Keyser (1987).)

9  
I cut the bread into thin slices.  
I crushed the limestone to pieces.  
I ground the corn fine.

The resultative prepositional phrase or adjective describes the effect on the object, of the action described by the verb. Depictives, on the other hand, describe the subject or object independently of the effect of the verb action. Depictives are underlined in the following examples:

10  
This horse can't run a furlong tired.  
I cut the bread hot.

Resultative secondary predicates are delimiting expressions, and depictive secondary predicates are not. They represent two distinct aspectual classes of expressions. Correlated with these aspectual classes are four syntactic differences.

(i) Depictives may be predicated of subjects or objects, as illustrated in 10 above, but resultatives may be predicated only of objects. In 11 below, the resultative adjective makes the sentence ungrammatical because the adjectives cannot be

associated with the subjects:

11

\*My brother ran ragged.  
(cf. I ran my brother ragged.)

\*He talked into a corner.  
(cf. He talked himself into a corner.)

(ii) Resultatives may occur in the middle construction before the adverbial 'easily', but depictives are ungrammatical or very poor in the same construction.

12

This bread cuts into thin slices easily.  
??This bread cuts hot easily.

Rothstein (1979) observes two more syntactic differences between resultatives and depictives. (Examples 13 and 14 are from Rothstein (1979).)

(iii) There may only be one resultative per sentence, but several depictives are possible:

13

a. \*John washed the clothes clean white.

b. They eat meat raw, tender. (Rothstein's source: Simpson 1982)

(iv) When resultatives and depictives occur together, the resultative must come first:

14

a. We hammered the metal flat hot.

b. \*We hammered the metal hot flat.

This last property holds as well for particles. The delimiting particle `up' must precede the non-delimiting depictive `hot' in the examples below:

15

- a. We ate up the muffins hot.
- b. We ate the muffins up hot.
- c. \*We ate hot up the muffins.
- d. \*We ate the muffins hot up.
- e. \*We ate hot the muffins up.
- f. \*We ate up hot the muffins.

Example 15f shows that the condition on the relative order of particles and depictives is not simply that particles must precede depictives, but that depictives must follow both the particle and the object.

Rothstein (1979) also notes interesting semantic differences between resultatives and depictives. Resultatives are selected by the verb. They may be nouns, adjectives, or prepositional phrases. Resultatives are underlined in the examples below. (Examples 16 and 17 are from Rothstein (1979).)

16

- a. We elected John president.
- b. He painted the car a brilliant red.
- c. He drank himself into a stupor.

Depictives, on the other hand, are not selected by the verb. Furthermore they have particular and subtle semantic constraints not shared by the resultative. In Rothstein's words, "the attribute described by the predicate must be at

the same time an intrinsic property of the subject, and a transitory one".<sup>4</sup>

17

- a. John ate the peanuts salted/\*salty.
- b. John ate the meat raw/burnt/\*tasty.
- c. I met Mary drunk/in high spirits/\*tall/\*stupid.
- d. We eat carrots raw/\*orange.

The sentences in 17 are grammatical with the adjectives that describe intrinsic and transitory properties. `Salted', describes a property of peanuts that is independent of John or any other peanut-taster, but `salty' describes a property that is in the tongue, so to speak, of the taster, rather than intrinsic to the peanuts. `Salted' also is a temporary property of peanuts, since they do not grow that way. `Drunk' is a transient property of Mary (giving Mary the benefit of the doubt), whereas `tall' or `stupid' is not likely to be so.<sup>5</sup>

Note also that depictives may not be nouns:

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4. Rothstein (1979) p. 153.

5. Hale (p.c.) and Rapaport (p.c.) note that good depictives describe a transitory `stage'. No adjective is inherently blocked from being a depictive secondary predicate. It is simply required to be interpreted as a `stage'. "John ate the peanuts salty" is acceptable if "salty" is understood as a `stage'. Also see Rapoport (1987).

\*John ate the meat steak.

I will return to a discussion of the semantic and syntactic properties distinguishing resultative and depictive secondary predicates in Chapter 5. The point to be noted here is that they are delimiting and non-delimiting expressions respectively, and that these aspectual differences are correlated with different kinds of syntactic behavior. A correct account of the syntax of these expressions must make reference to the aspectual property of delimitedness.

### 2.3 Finnish case

In Finnish, delimitedness is expressed by case. A verb phrase or a sentence with an object noun in accusative case describes a delimited event. If the object is in partitive case the event is non-delimited. Heinämäki (1984) shows that accusative case is used when the event has some temporal limit that must be achieved. (Examples 18 through 23 are from Heinämäki (1984).)

19

- a. Maria kantoi kirjaa  
M. carried book-PART  
"Maria was carrying a book."
- b. Maria kantoi kirjan  
M. carried book-ACC  
"Maria carried the book."

Only 19b, where the object 'book' is marked with accusative case, carries the inference that Maria carried the book to

some destination.

The temporal bound of the event, required by the accusative case, may also be provided by a change of state:

20

- a. Metsästäjä ampui vahingossa lehmän  
hunter shot accident-in cow-ACC  
"The hunter shot a cow by accident."
- b. Metsästäjä ampui vahingossa lehmää  
hunter shot accident-in cow-PART  
"The hunter shot (at) a cow by accident."

Example 20a is generally understood to mean that the cow was shot dead, whereas 20b does not carry that implication. The death of the cow provides an endpoint to the event.

The temporal bound of the event may be inferred or stated:

21

- a. Maija luki kirjan  
M. read book-ACC  
"Maija read (all) the book."
- b. Maija luki kirjan loppuun  
M. read book-ACC end-to  
"Maija read the book to the end."
- c. Maija luki kirjan puoliväliin  
M. read book-ACC halfway through  
"Maija read the book halfway through."
- d. Maija luki kirjan hajalle  
M. read book-ACC to pieces  
"Maija read the book to pieces."

In 21a, where no event terminus is stated, the object 'book' itself provides the terminus for the event because the event is understood to continue until all the book is read. In 21b

through 21d a bound for the event is specified, and the sentence is understood accordingly.

If a bound for the event is not easily inferrable through the verb and no bound is explicitly stated, the sentence is odd. Examples 22a and 22c with the object in partitive case have no stated bound, and one is not easily inferrable from the verbs `heitti' and `nostti'. If the explicitly stated bound were omitted in the examples 22b and 22d, which have the objects in accusative case, the sentences would be odd.

22

- a. Tiina heitti keihästä  
T. threw javelin-PART  
"Tiina threw the javelin."
- b. Tiina heitti keihään metsään  
T. threw javelin-ACC forest-into  
"Tiina threw the javelin into the forest."
- c. Yrjö nosti hattua  
Y. lifted his hat-PART  
"Yrjö raised his hat (when greeting)."
- d. Yrjö nosti hattun hyllylle  
Y. lifted his hat-ACC  
"Yrjö raised his hat onto the shelf."

Some verbs which usually take partitive objects can take accusative objects if an event terminus is provided as in 23b and 23d below:

23

- a. Manne kehui hevosta  
M. praised horse-PART  
"Manne was praising the horse."
- b. Manne kehui hevosen maasta taivaaseen  
M. praised horse-ACC earth-from heaven-to

"Manne praised the horse from earth to heaven."

- c. Minä pelkään sotaa  
M. fear war-PART  
"I am afraid of war."
- d. Pelkäsin itseni puolikuoliaaksi  
I-feared myself-ACC half-dead-to  
"I scared myself half dead."

Recall that in English the application of durative adverbials distinguishes between delimited and non-delimited expressions. Delimited expressions in English are ungrammatical with durative adverbials, in a semelfactive reading. Durative adverbials in Finnish also distinguish between delimited and non-delimited expressions. Durative 'for' adverbials are grammatical with non-delimited expressions and ungrammatical with delimited ones.

24

- a. Maria kantoi kirjaa tunnin  
M. carried book-PART hour-ACC  
"Maria carried a book for an hour."
- b. Maria kantoi kirjan \*tunnin  
M. carried book-ACC hour-ACC  
"Maria carried a book (to some place) \*for an hour."

The examples above illustrate that the distinction between delimitedness and non-delimitedness is grammaticalized in the accusative and partitive cases in Finnish.<sup>6</sup>

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6. According to Heinämäki, there are some Finnish verbs which normally take accusative objects, but which may on occasion take partitive objects. These are usually verbs of cognition and perception. Heinämäki suggests that the reason for their strong accusative orientation is that they are frequently used

## 2.4 Morphological aspect

Certain generalizations about syntactic behavior must make reference to delimitedness in order to be correctly stated. This is true in a language like English, where delimitedness is not overtly marked, and in a language like Finnish, where it is marked in the case system. In some languages, delimitedness is marked directly in the verbal morphology. The fact that delimitedness may be grammaticalized demonstrates its importance in natural language.

Linguists recognize several kinds of aspectual distinctions marked in the morphology of natural languages.<sup>7</sup> Among these are the perfective, the progressive, and the perfect. Of these it is the perfective that is most relevant to

-----  
as achievement verbs. In any case, it is not clear what the semantic entailments of the partitive case are for these verbs. Sometimes it imparts a partial quality to the event:

- (i) Tunnen (hiukan) sitä miestä (Leino, 1982)  
I know little that man-PART  
"I know that man (a little bit)."

but this may also be found with accusative case:

- (ii) Tunnen hänet hyvin epätäydellisesti  
I know her-ACC very incompletely  
"I know that man (a little bit)."

7. See Comrie (1976), Timberlake and Chung (1985).

delimitedness.<sup>8</sup> The perfective/imperfective opposition is generally described as distinguishing between completed actions and actions in progress, a distinction which for practical purposes amounts to a delimited/non-delimited distinction. However, complicating factors enter into the semantic analysis of perfective and imperfective markers for two reasons; (i) there is variability in exactly what is indicated by perfective and imperfective markers cross-linguistically; and (ii) they may interact with tense, modality, discourse, and adverbial expressions. I will discuss each of these in order.

There is much freedom across languages as to how the perfective and imperfective markers register definite or indefinite temporal duration of events. Chamorro and Russian represent two different strategies that languages may employ for classifying events aspectually. In Russian the perfective marker is used when the event has both definite duration (is telic) and is closed with respect to the time frame it is viewed in. That is, a time frame is provided (possibly through discourse factors) against which the event is measured, and if the event has an endpoint within that time frame it is closed with respect to that frame. If it does

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8. The progressive and perfect are not irrelevant for a discussion of delimitedness, but their connection with delimitedness is less straightforward than that of the perfective. The progressive will be discussed in Chapter 5.

not, it is open. In 25 below the `when' clause defines the time frame for the event. In 25a the temporal duration of the event indicated by the main clause event is not included within that of the `when' clause, and the imperfective marker applies to the main verb. In 25b, the situation is reversed, the temporal duration of the main clause is included within that of the "when" clause, and the perfective marker applies. (Examples in 25 and 26 are from Timberlake and Chung (1985).)

25

- a. Kogda tanki dostigli kanala, fašisty kak raz  
 when tanks reach(PERF) canal fascists just then  
 vzryvali most  
 blow up(IMPERF) bridge

"When the tanks reached the canal, the fascists just then were blowing up the bridge."

- b. Kogda tanki dostigli kanala, fašisty vzorvali most  
 when tanks reach(PERF) canal fascists blow up(PERF) bridge

"When the tanks reached the canal, the fascists blew up the bridge."

In Chamorro (a Western Austronesian language) there is an aspectual marker -- the neutral or non-progressive marker -- which applies to events which have a duration within the time frame from which they are viewed, whether or not the events have a definite duration. The verbs meaning `run' and `chase' in 26a and 26b do not describe events with a definite endpoint. The neutral marker (NL) applies because the events are temporally contained within the time frame from which they are viewed.

26

- a. Malagu yu' nigap  
run(NL) I yesterday  
"I ran yesterday."
  
- b. Lao ti ha-dúlalak yu' i ga'lagu  
but not 3SG-chase(NL) me the dog  
"But the dog did not chase me."

Russian has an aspectual marker (perfective) that indicates events with an inherent temporal limit (telic events) and a temporal limit within the time frame. Chamorro has an aspectual marker (neutral) that indicates events with a temporal limit within the time frame, whether or not those events have inherent temporal limits (whether or not they are telic). In both cases the aspectual markers apply in the description of events with temporal limits, but the type of events grouped together differs slightly between the two languages.

Russian and Chamorro represent two different ways in which a language may flesh out semantically, the aspectual distinctions related to an event's definite duration over time. I will not discuss further the variation in semantic interpretation of morphological aspectual markers such as these. The point of this discussion is to establish that their 'meaning' includes some reference to the property of delimitedness.

The second complicating factor regarding morphological aspect and delimitedness is that delimitedness may interact

with tense in particular ways. Many languages have co-occurrence restrictions between tenses and morphological aspects. Comrie (1976) notes that ChiBemba (a Bantu language) has three tenses: past, present, and future. The perfective and imperfective aspects may occur with the past or the future tense, but only the imperfective may occur with the present tense. In the same vein, some languages seem to have combined tense and aspectual markers in their morphology. Comrie (1976) also observes that in Arabic there is an opposition which we will call here perfective/imperfective, although it indicates more than perfective aspect. The perfective is used for perfective aspect, past tense, and relative past tense. (Examples 27 and 28 are from Comrie (1976).)

27

a. perfective and past:

Jalasū(PERF) ʕalā 'l-bābi.  
 "They-sat-down at the door."

b. relative past:

?ajī?u(IMP) -ka ?idā 'hmarra(PERF) 'l- busru.  
 I-come to-you when it-ripen the unripe-date  
 "I shall come to you when the unripe date ripens (shall ripen)."  
 (The ripening of the date is past with respect to my coming.)

The imperfective form is used to indicate imperfective meaning or (relative) non-past tense.

28

a. imperfective and present:

?allahu yaʕlamu(IMP) bi- mā taʕmalūna(IMP).  
 God he-know about what you-do  
 "God knows what you are doing."

b. relative future:

?arsala(PERF) yuḡlimu(IMP) -hu bi- ḡālika.  
he-sent he-inform him about this  
"He sent (someone) in order to inform him about this."

c. imperfective (although with relative past):

Wa ?attabaḡuwā (PERF) mā tatlū(IMP) 'l šayāṭinu ḡalā  
and they-follow what they-recite the demons in

mulki sulaymāna.  
reign Solomon

"And they followed what the demons used to recite in  
Solomon's reign."

The nature of the interaction of morphological aspect with tense and discourse (and modality as well, although this is not illustrated above) depends on complex semantic, discursal and perhaps even pragmatic factors that are beyond the scope of this thesis. It must be mentioned that in spite of the obvious interactions between tense and aspect that are revealed by co-occurrence restrictions of the kind discussed above, these do not necessarily argue against treating tense and aspect as separate entities. Tense and aspect are not in complementary distribution, as they would be if they belonged to the same syntactic category. Co-occurrence restrictions may be explained by a variety of extra-syntactic factors. The apparent merging of tense and aspect into single morphemes, as in the Arabic examples, may actually be an instantiation of such co-occurrence restrictions. In this thesis aspect and tense are treated as independent entities in natural language.

These examples from Russian, Chamorro, ChiBemba, and Arabic

serve to illustrate that there is not necessarily a simple and direct mapping from delimitedness to morphological aspect. I do not intend to discuss the factors entering into how a language may use morphological markers of perfectivity. I intend merely to illustrate that definite or indefinite temporal duration (delimitedness/non-delimitedness) is one of the properties referred to by morphological aspect, and consequently delimitedness must be represented in the grammars of these languages.

The preceding discussion has focused on the complications inherent in looking to morphological aspect for clearcut expressions of the delimited/non-delimited distinction. However, there are languages in which morphology directly expresses that distinction. Russian has a set of verbal prefixes, different from the Russian perfective and imperfective morphology discussed above, which mark delimitedness directly. The prefixation process is productive, although there are some lexical constraints on which prefixes may affix to which verbs. These prefixes convert a verb describing non-delimited events into one describing delimited events. They may add a straightforward aspectual content to the verb without imparting new lexical meaning, as in the examples below. (Examples in 29 and 30 are from Brecht (1984).)

29

<u>kurit'</u>	"smoke"
<u>vykurit'</u>	"finish smoking"
<u>dokurit'sja</u>	"smoke to a climax"
<u>zakurit'</u>	"begin to smoke, light up"
<u>zakurit'sja</u>	"smoke too much"
<u>nakurit'sja</u>	"smoke one's fill"
<u>pokurit'</u>	"smoke for a while"

Prefixes may also alter the meaning of the verb slightly, but in such a way that the verb describes a delimited event.

30

<u>čitat'</u>	"read"
<u>perečitat'</u>	"reread"
<u>začitat'</u>	"read out"
<u>dočitat'</u>	"read up to"
<u>vyčitat'</u>	"find (in a book)"

Perfectivizing prefixes in Russian represent a relatively productive morphological process that depends on the property of delimitedness.

In summary, although for a variety of reasons morphological aspect does not always instantiate a clear and direct mapping between delimitedness and morphology, at the very least it makes reference to the definite or indefinite duration over time of an event. And some aspectual morphology directly expresses the property of delimitedness. These facts argue for the importance of delimitedness in the grammars of natural languages.

## 2.5 Affectedness

The term 'affectedness' as it is used in the literature

describes the semantic properties of a class of verbs and their direct arguments which have certain syntactic properties. In this and the following chapter, the semantic properties associated with 'affectedness' will be demonstrated to be aspectual in nature. In this section the class of affectedness verbs (verbs with 'affected' arguments) and their special properties are introduced.

### 2.5.1 English middles and noun phrase passivization

M. Anderson (1979) describes the class of arguments which cannot undergo passivization in noun phrases as 'affected' arguments.<sup>9</sup> Noun phrase complements of nominal predicates may be passivized if they are affected arguments, in the sense of being "changed or moved by the action of the head nominal".<sup>10</sup> The sentences in 31 describe events in which the objects ('the city' and 'the natives') are affected by the actions of destruction or conversion expressed by the verbs. These objects can be passivized, as in the b) examples. The sentences in 32 describe events in which the objects ('Bill' and 'the cat') are not affected by the actions expressed by

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9. For M. Anderson, NP passivization is 'NP Preposing'. Her syntactic account of the phenomenon depends on a rule-based grammar, which I do not adopt. 'NP passivization' and 'NP Preposing' name the same phenomenon, although they imply different assumptions about grammar and different views about the syntax of the phenomenon.

10. M. Anderson (1979) p.44.

the verbs, and these objects consequently cannot be passivized in the b) examples:

31

- a. The Mongols' destruction of the city.
- b. The city's destruction by the Mongols.
  
- a. The missionaries' conversion of the natives
- b. The natives' conversion by the missionaries

32(These examples are from M. Anderson (1979).)

- a. John's avoidance of Bill.
- b. \*Bill's avoidance by John.
  
- a. Sally's pursuit of the cat.
- b. \*The cat's pursuit by Sally.

M. Anderson identifies two other classes of derived nominals which have preposable object arguments, and which require a slightly extended definition of affectedness. These are nouns that imply creation, such as `performance', `definition', `publication', `translation' and `portrait', and nouns of concealment or exposure. (Examples in 33 are from M. Anderson (1979).)

33

- a. The company's performance of the play
- b. The play's performance by the company
  
- c. John's definition of that word
- d. That words' definition by John
  
- e. Mouton's publication of the book
- f. The books' publication by Mouton
  
- g. John's translation of the poem
- h. The poems' translation by John
  
- i. Mary's portrait of the Senator
- j. The Senator's portrait by Mary
  
- k. John's concealment of the knife

- l. The knife's concealment by John
- m. Alice's exposure of the corruption
- n. The corruption's exposure by Alice

M. Anderson includes these preposable object arguments of the derived nominals as being 'affected' arguments, by an extension of the definition of affectedness. Even though they are not physically altered in the event described by the nominal, their relation to the observer is altered. Looked at in this way, they are included in the class of affected arguments.

Verbs with affected arguments have a second distinguishing syntactic property. They may form middles. The following examples are from Hale and Keyser (1987):

- 34
- a. This wood splits easily.
  - b. This door opens easily.
  - c. This cinch tightens easily.
  - d. This wheel spins easily.

In 34a through 34d the argument is affected. Examples of verbs which do not have affected arguments and cannot form middles are shown below. (These examples are from Roberts (1985).)

- 35
- Idioms:<sup>11</sup>

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11. The following minimal pairs (pointed out to me by Beth Levin) demonstrate a verb which can form the middle only in its non-idiomatic usage: 'Fine china breaks easily' vs.

\*Advantage takes of John easily.

Perception verbs with small clause complements:

\*John sees sing easily.

Exceptional case marking verbs:

\*John believes to be a fool easily.

Double object verbs:

\*Orphans give presents easily at Christmas.

Psychological activity verbs:

\*This theorem learns fast.

Perception verbs:

\*The mountains see beautifully after rain.

The semantic property that allows verbs to form middles has been discussed by Hale and Keyser (1987) and by Roberts (1985). Hale and Keyser (1987) identify the Lexical Conceptual Structure<sup>12</sup> of verbs that can form middles as:

<sup>36</sup>  
[x cause [y "undergo change"], (by...)]

where x and y are arguments of the verb. This characterization says that a verb with two arguments, one causing the other to undergo a change, is a verb that can form a middle.

Roberts (1985) discusses affected arguments and the role they play in the formation of middles. He labels the affected arguments themes, and argues that the presence of an internal

-----  
'\*Good news breaks easily'.

12. For discussion and explanation of Lexical Conceptual Structure Hale and Keyser (1986, 1987).

theme argument entails a change of state. (Roberts 1985, p.393):

A clause containing the n-place predicate  $F(n_1 \dots n_n)$  where  $n_1$  is an internal Theme argument denotes a true proposition iff the referent of the Theme argument undergoes a change of state.

Roberts defines the expression 'change-of-state' as follows:

...some property of the Theme held before the time with respect to which the proposition containing the predicate is evaluated and fails to hold after that time, or vice versa.

Under Robert's definition, an affected argument (or an internal Theme argument) is one that undergoes a change of state, and a change of state provides a temporal bound for the event.

The property of affectedness which permits the formation of middles and noun phrase passives in English correlates with the existence of a temporal bound for the event described by the verb. In other words, affectedness depends on delimitedness. This will be demonstrated in greater detail in Chapter 3. The point to be made here is that the class of affectedness verbs and affected arguments in English is distinguished syntactically. This is another example of the syntactic consequences of the semantic property of delimitedness.

### 2.5.2 Japanese nominal quantifiers

Miyagawa (1987) has observed a type of NP movement in Japanese that depends on the property of affectedness for the correct statement of the syntactic generalization. Japanese has a set of nominal quantifiers that may occur following the noun phrase. These consist of a numeral and a clitic marking the noun class. `San-nin' which follows the subject in 37a below, and `san-satu' which follows the object in 37b, are examples: (Data in this section are from Miyagawa (1987).)

37

a. Gakusei ga san-nin ofisu ni kita.  
 students NOM 3-clitic(people) office to came  
 "Three students came to my office."

b. Hanako ga hon o san-satu katta.  
 NOM book ACC 3-clitic(volumes) bought  
 "Hanako bought three books."

Scrambling of the nominal quantifier from the postnominal position within the verb phrase to the head of the sentence is possible when the object is affected (as in 37), and impossible when it is not (as in 38):<sup>13</sup>

38

a. Futatu, Taroo ga mado o aketa (koto).  
 two-clitic NOM window ACC opened  
 "Taroo opened two windows."

b. Mittu, Ziroo ga onigiri o tukutta (koto).  
 three-clitic NOM rice balls ACC made  
 "Jiro made three rice balls."

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 13. Scrambling of nominal quantifiers out of post-subject position is impossible for independent reasons. See Miyagawa (1987) for details. For more discussion of scrambling in Japanese, see Saito (1985).

- c. Nimai, akanboo ga sara o watta (koto).  
 two-clitic baby NOM plates ACC broke  
 "The baby broke two plates."

39

- a. ?\*Hitori, Tanaka-sensei ga gakusei o hometa (koto).  
 one-clitic Prof. Tanaka NOM student ACC praised  
 "Professor Tanaka praised one student."
- b. ?\*Futari, Taroo ga kodomo o donatta (koto).  
 two-clitic NOM children ACC shouted at  
 "Taroo shouted at two children."
- c. ?\*Hitori, Hanako ga kurasumeeto o kiratte iru (koto).  
 one-clitic NOM classmate ACC hate  
 "Hanako hates one of her classmates."

The distinction between affected and unaffected arguments is also marked by a construction referred to as the 'intransitivizing resultative' (Martin, 1975). This consists of the continuative form of the verb, marked by '-te', followed by 'aru' (one of two Japanese verbs that can be translated as 'be'). This construction changes a transitive verb into an intransitive one, and gives it a resultative sense. It applies to verbs with affected arguments (39), but not to verbs with unaffected arguments (40).

40

- a. Mado ga akete aru.  
 window NOM opened  
 "The window is opened."
- b. Onigiri ga tukutte aru.  
 rice balls NOM made  
 "Rice balls are made."
- c. Sara ga watte aru.  
 plate NOM broken  
 "The plate is broken."

41

- a. \*Ano gakusei ga homete aru.  
that student NOM praised  
"That student is praised."
- b. \*sono kodomo ga donatte aru.  
that child NOM shouted at  
"That child is shouted at."
- c. \*kurasumeeto ga kiratte aru.  
classmate NOM hated  
"A classmate is hated."

The constraint on scrambling of Japanese nominal quantifiers out of verb phrases, like the constraints on English middles and noun phrase passives, must be stated in terms of affectedness.

### 2.5.3 Total affectedness.

Roberts (1985) and M. Anderson (1979) use the term 'affectedness' to mean the property of an argument which undergoes a change of state during the course of the event described by the verb. The term 'affectedness' has been used in another sense; to describe an argument that is holistically or totally affected by the action of the verb. I will refer to this as total affectedness. (The examples in 42 below are from S. Anderson (1977).)

42

- a. Bees swarmed in the garden.
- b. The garden swarmed with bees.

42b implies that the garden was full of bees, that is, all of the garden contained bees, or the garden was totally affected,

while 42a does not have the same implication.<sup>14</sup> Total affectedness is closely related to affectedness. It is also an aspectual property based on delimitedness, since an event in which the argument is changed in all parts of itself must be a delimited event.<sup>15</sup> Like affectedness, total affectedness is only associated with the direct argument of the verb.<sup>16</sup> Total affectedness is therefore a semantic property that is syntactically constrained. In 42a 'the garden' is not the direct argument of the verb. In 42b (where swarm is used as an unaccusative verb)<sup>17</sup> 'the garden' is the direct argument.

This distinction is even clearer in transitive verbs. The examples below are from English, Dutch, and Japanese:

43

English:

- a. Jeremiah sprayed paint on the wall.
- b. Jeremiah sprayed the wall with paint.
  
- a. Josiah cleared dishes from the table.
- b. Josiah cleared the table of dishes.

-----

14. Some speakers of English get optional total affectedness readings. These speakers find that a totally affected interpretation of 'the garden' is a grammatical option in 42b but not in 42a.

15. For many types of verbs a delimited reading necessitates a totally affected interpretation.

16. Direct argument-hood is syntactically defined; the direct argument of the verb is the sister to the verb at deep structure.

17. The theory of unaccusative verbs will be addressed in detail in Chapter 6.

Dutch: (De Groot (1984); his source, Dik (1980))

- a. Jan plant bomen in de tuin.  
"John plants trees in the garden."
- b. Jan beplant de tuin met bomen.  
"John be-plants the garden with trees."

Japanese: (Fukui, Miyagawa, Tenny (1985))

- a. kabe ni penki o nuru  
wall on paint ACC paint(VERB)  
"smear paint on the wall"
- b. kabe o penki de nuru  
wall ACC paint with paint(VERB)  
"smear the wall with paint"
- a. taru kara sake o akeru  
barrel from sake ACC empty  
"empty sake from the barrel"
- b. taru o akeru  
barrel ACC empty  
"empty the barrel"

In the b) sentences of 43 the object is the verb's direct argument, and the sentences all carry the implication of the object's having been totally affected. After the event described by the b) sentences has transpired, the entire wall is covered with paint, the table is empty of dishes, the garden is full of trees, and the barrel is completely empty. What are the direct arguments of the b) sentences are the indirect or oblique arguments of the a) sentences. In the a) sentences, they are not understood to be totally affected.

Affectedness and total affectedness are semantic properties, but they are correlated with distinct and consistent syntactic behaviors or syntactic positions. Like delimitedness, affectedness and total affectedness are semantic properties

that must be accessible to the syntax of natural language grammars.

#### 2.5.4 Affectedness and Transitivity

The property of affectedness which correlates with English middles and noun phrase passives, and the property of total affectedness discussed in the previous section are only associated with the direct arguments of particular verbs -- not with the indirect or external arguments. The correlation between affectedness and direct argument-hood has led to the idea expressed in the literature that affectedness correlates with transitivity.<sup>18</sup> With transitive verbs the direct argument, i.e. the object, may be an affected argument, while the subject may not be affected. Kenny (1963) expressed this elegantly:<sup>19</sup>

...if we ask, regarding any action: what changes as a result of the action? Is it the agent or the patient: i.e. is it the subject or the object of the verb reporting the action? With an important exception, to be considered later, the answer is always: the object. When A  $\phi$ s B, it is essential that after this event B should have changed; it is not essential that A should have changed. The stove, after it has boiled the kettle, may look, feel, and behave exactly as it did before doing so; but the kettle cannot have been boiled by the stove unless it is warmer than it was when the process of boiling started. To find out whether you have washed the dishes it is of little use to inspect you; whereas an examination of the dishes is always a help to settling the question, and may indeed settle it definitely, if they are still dirty. To be

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18. See Hopper and Thompson (1979).

19. Kenny (1963) pp. 180-181.

sure, there will very often be a change in the agent as a result of an action: when I have chopped down the oak-tree, I am usually hotter and stickier than when I started. But this is not essential to the truth of "I have cut down the oak" as it is essential to its truth that the oak should not be in the same condition as it was. If I am so strong or so skillful that I can chop down the oak without turning a hair, no matter; but no amount of strength or skill could make it true to say that I had cut down the oak-tree without denting its bark.

"The important exception" mentioned by Kenny refers to the fact that an agent may be said to have changed because it has carried out an action, i.e., some proposition in the past tense about the agent is now true, which was not true before. This is so with both the agent and the patient. But this is a qualitatively different kind of change from that which must be true of the patient's present state.

Affectedness correlates with direct argument-hood rather than with subject- or object-hood. Whereas the direct argument of a transitive verb (a verb taking two arguments) will be the object, the direct argument of an unaccusative verb will be its subject. The subjects of many unaccusative verbs are also affected arguments (e.g.: 'The ice melted', 'The grass burned'.)

It has been argued that affectedness of the object is the semantic property crucial for transitivity, rather than the agency or volitionality of the subject. Tsunoda (1985) points this out with the English examples below:

44

- a. I hit him.
- b. I hit at him.

44a is transitive because it has a nominative-accusative case frame. The patient<sup>20</sup> 'him' in 44a is the direct argument of the verb, and in this sentence it may be understood to delimit the event like an affected object.<sup>21</sup> However, 44a may express a situation with or without volitionality and agency on the part of the subject. The conative alternant of 44a is the intransitive 44b, in which the patient 'him' is not a direct argument and is not affected, and the subject must have the properties of volitionality and agency. These two sentences demonstrate that morphosyntactic transitivity (in the sense of having a nominative-accusative case frame) does not depend on volitionality and agency of the external argument (the subject 'I' in these sentences). If anything, it is linked to the affectedness of the internal or direct argument.

Affected arguments are direct arguments. However, the converse of this statement has also been expressed in the literature: that direct arguments are affected arguments, or

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20. The term 'patient' refers to the thematic role the NP has in the sentence. Thematic roles will be discussed at greater length in Chapters 4 and 6. An argument with a 'patient' thematic role represents a participant in the event described, which is the recipient of the action expressed by the verb.

21. The reader is warned that verbs of contact ('hit', 'poke', 'tap') are rarely affectedness verbs, although 'hit' may be ambiguous in this respect. Verbs of contact will be discussed further in section 3.3.1.

at least more affected than indirect or external arguments. This is not true of affectedness in the explicit sense defined in this chapter -- in the sense of the argument undergoing a change of state that makes the event in which it participates a delimited event. This is the sense of affectedness which correlates with middles and noun phrase passives. However, it is correct to say that an argument of the verb seems more "affected" by the action described by the verb when it is expressed as the verb's direct argument, than when it is expressed as an indirect argument. (To avoid confusion, I will indicate this intuitive use of the term "affected" by enclosing it in quotation marks. The only such use of the term in the entire thesis is in this section, 2.5.4.) There are cases in which an argument may be expressed either as the direct or indirect object of the verb in semantic paraphrases. In these cases the argument seems more "affected" when it is the verb's direct argument. English provides many examples of this. The following are from Givon (1984).

45

a. She swam the Channel.

b. He rode the horse.

(= `swim across the Channel')

(= `ride on the horse')

The sentences under 45 may seem to be semantic correlates with their paraphrases at the right. However, `swim the Channel' has a sense of mastering the Channel that `swim across the Channel' does not imply. `Ride the horse' means to control

the horse, while 'ride on the horse' means little more than to be perched upon and transported by the horse. In both cases, even though the object seems not to be greatly "affected" by the action of the agent, it is more "affected" when it is the direct argument than when it is the indirect argument. This is true even of 45b which expresses a non-delimited event.

Reanalysis of a verb and a preposition is sometimes possible, a process which makes an indirect argument into a direct argument. One test for a reanalyzed verb-preposition construction is the possibility of forming pseudo-passives such as:

46

The ball was run over by a truck,

in which 'run over' is a verbal constituent and 'ball' its passivized direct argument. S. Anderson (1977) noted that pseudo-passives correlate with the argument seeming "affected" in the event. (47 is from S. Anderson (1977).)

47

a. This bed has been slept in (by George Washington).

b. \*Cleveland seemed run amok in by John.

The reanalysis of 'sleep in' that makes 47a grammatical also implies the bed has been "affected" by George Washington's sleeping in it. The bed is somehow changed or made special by this having happened to it. The ungrammatical 47b, on the other hand, has no reanalysis, and no implication that

Cleveland has been basically changed by John's running amok in it.

The property of affectedness which correlates with English middles and noun phrase passives is associated only with direct arguments -- the objects of transitive verbs and the subjects of unaccusative verbs. Direct argument-hood itself, even when not associated with affectedness in the strict sense, imposes some special interpretation in which the argument seems more "affected" when it is expressed as a direct argument than when it is expressed as an indirect argument. The direct argument is semantically as well as syntactically privileged. Chapter 3 will address affectedness in the technical sense -- the sense in which it is based on delimitedness. Chapter 4 will consider the special properties of direct arguments (as opposed to indirect or external arguments) that lead to their privileged interpretations.

## Chapter 3. An Aspectual Theory of Affectedness

### 3.1 Affectedness as an Aspectual Property

The term 'affectedness' characterizes a semantic property of some verbs and their direct arguments which correlates with a range of cross-linguistic syntactic behaviors, among them middle formation and noun phrase passivization in English. The property of affectedness has clear syntactic diagnostics but its semantic definition has been somewhat amorphous. Semantic definitions of affectedness in the literature are based on the notion of the affected argument of the verb being caused to undergo some change during the course of the event described by the verb. A more explicit and enlightening definition of affectedness is provided by treating it as an aspectual property dependent on delimitedness. Affectedness may be defined as the property of a verb, such that it describes a situation or happening that can be delimited by the direct argument of the verb. Affectedness verbs describe events<sup>1</sup> which are 'measured out' and delimited by their direct arguments. Affectedness defined in this way as an aspectual property more adequately characterizes the verbs that allow middles and noun phrase passives than the definition of affectedness based on the notion of 'undergoing change'. This aspectual definition of affectedness applies to

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1. The term 'event' is used here to mean the situation or happening described by a verb, in which the arguments of the verb participate.

a range of verb classes. Verbs of consumption and creation, verbs expressing a change of state, achievement verbs, and verbs of motion are encompassed in the aspectual definition of affectedness. Some verbs which allow middle formation and NP passivization but do not fall under the definition of affectedness based on 'change', fall under the aspectual definition based on delimitedness. The aspectual definition of affectedness also accounts for the fact that verbs capable of ambiguity between delimited and non-delimited readings select the delimited readings in constructions such as middles and NP passives. In the following sections the aspectual definition of affectedness is developed and applied through an investigation of the lexical semantics of several verb classes.

### 3.1.1 Verbs of consumption and creation.

Hale and Keyser (1987) characterized verbs that form middles as having a lexical conceptual structure like the following:

<sup>1</sup>  
[x cause [y "undergo change"]]

The idea that these verbs express a 'meaning' in which one of the verb's arguments causes some change in the other argument, makes fairly accurate predictions about which verbs will show the syntactic behavior associated with affectedness. The idea of change is central to affectedness. Consider what change is, and how it is related to delimitedness. In the simplest

and most concrete view, change is the re-arrangement of things or properties in space, viewed over time. We may view the situation described by a verb as the collection of changes that occur in (or among) each of the verb's arguments during the course of the event described by the verb. A change of state in one of the verb's arguments will provide a distinct temporal marker -- an endpoint -- for the event. If there is a central change in the event, the argument that undergoes that change is responsible for much of the temporal quality of the event. If the argument achieves a final or absolute change of state it is responsible for delimiting the situation described by the verb. Furthermore, if that argument undergoes the change gradually, it 'measures out' the progress of the event towards that endpoint in increments of change over time. Many verbs of consumption and creation can be characterized in this way. The verb 'eat' is an example:

2

eat an apple

The apple referred to by the direct object in 2 'measures out' gradually the event described by the verb phrase. Someone who eats an apple progresses through the event in increments of apple. 'Eat an apple' is a delimited accomplishment because the action of eating an apple may result in the total consumption of the apple. We may think of an event as a series of snapshots of the objects involved, at points along a time line. The snapshots record the property that is changing

in the object. (Since the apple is being consumed, the property that is changing is that of size or spatial extent.) In the case of apple-eating there will eventually be some snapshot in which the apple is gone, and all subsequent snapshots will have no apple. It is the existence of this distinctive point of time, provided by some changing property of the object, that makes a delimited accomplishment.

With a verb like 'eat', that describes a gradual change, the direct argument can be said to 'measure out' the event. The changing property of the argument may be partitioned into equal sub-parts so that it becomes a scale, and the event 'measured out' in terms of that scale. In the case of a verb phrase like 'eat an apple', the scale applied to the event is finite, and 'measuring out' the event yields a definite value. If I eat an apple, I eat one bite of it at time  $t_1$ , another bite at  $t_2$  and so on until at some  $t_n$  the apple is gone because the apple has finite spatial extent. This is true of all verbs that describe changes that progress over time through subparts of the object that is the verb's direct argument. If a piece of ice melts, some of it has melted by the end of  $t_1$  and more of it has melted by the end of  $t_2$ , and all of it has melted by  $t_n$ . If I draw a circle, I draw part of it during  $t_1$ , part of it during  $t_2$  and so on until at  $t_n$  the entire circle is drawn. The delimited reading of such

expressions entails that I never eat the same part of the apple twice, or draw the same stretch of circle twice, and no portion of the ice melts and freezes and melts again. It assumes that I eat all the chunks of apple, and eat each of them only once. In such a case the apple itself imposes a finite and definite duration on my eating of it. Thus the object is a measure of the event, as if I had performed one apple's worth of eating. <sup>2</sup>

Now compare 'eat an apple' with 'push a cart'. Pushing a cart is a non-delimited activity instead of a delimited accomplishment. A snapshot series of cart-pushing will record changes in the cart's location over time but there will be no distinctive snapshot to mark the end of the event.

The preceding discussion illustrates how delimitedness may be imposed on the event through the direct argument of the verb. The property of affectedness is redefined here as follows:

<sup>3</sup>  
A verb is an affectedness verb iff it describes an event that can be delimited by the direct argument of the verb.

Taking the term 'argument' to refer ambiguously to either a

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2. The delimited reading is not always required where it is possible; in fact this varies across languages and may be morphologically marked.

syntactic or a semantic element, I will define 'affected argument' in both domains:

4

A syntactic argument is an affected argument iff it is the direct argument of an affectedness verb, and its referent delimits the event described by the verb.

5

A semantic argument is an affected argument iff it independently delimits the event in which it participates.<sup>3</sup>

This view of affectedness explains why verbs like 'perform', 'read' or 'record', which do not seem intuitively to describe actions which affect or change their objects, should belong in this class. 'Perform', 'read' and 'record' may form middles, and may appear in passivized noun phrases:

6

- a. This play performs easily.  
the play's performance by the company (M. Anderson, 1979)
- b. This paper reads easily. It is very well written.  
The paper's reading at the chemical society created a lot of excitement.
- c. This magnetometer data recorded easily. The data from the echo-sounder was more of a problem, because the scale continually needed to be readjusted.

This data's recording was not the problem. It was the analysis that caused us so much trouble.

The referents of the direct arguments, 'play', 'paper' and

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3. The term 'independently' is included in this definition to rule out Goal arguments represented in the syntax as indirect arguments of the verb. This will be explained more fully in Chapter 4.

`data', `measure out' the events of performing, reading and recording. When a play is performed or a paper read, the event of performing or reading proceeds through the play or paper incrementally -- during each subinterval of performance or reading time a sub-part of the play is performed, and a sub-part of the paper is read. When a set of data is recorded, more and more data is recorded until finally all of it is recorded. The direct argument delimits the event. Nothing else need be said to explain why `perform', `read' and `record' have affected objects.<sup>4</sup> Hale and Keyser's definition

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4. A digression is in order here about the variability of speaker judgements about middles. The judgements here are those of the author, which are shared by other speakers consulted. However, these judgements are fairly liberal, and many speakers have much more constrained middle formation in their grammars. For those speakers with somewhat less liberal judgements, it is predicted that they will find the same pattern of relative acceptability based on the object's ability to delimit the event. It is also predicted that speakers with conservative middle formation will have conservative NP passivization as well. For those speakers who accept virtually no middles at all, this pattern of relative acceptability will not be apparent. Other factors intervene in the grammars of such speakers to rule out middle formation. (These factors may include discourse or stylistic conditions requiring the sentence to be construable as being `about' the subject. Van Oosten (1977) argues in this vein that middle formation is constrained by the requirement that some properties of the subject must be understood as partly responsible for the action expressed by the verb.) The variability in judgements also reflects a variability in the lexical meanings of verbs. Speakers do not learn and use the same verbs in exactly the same manner. The verb `read' is an example. Most speakers get both a delimited and a non-delimited reading for `read the book', but for some speakers only one or the other is possible. Which readings are possible depends on the `meaning' assigned to the verb in the speaker's lexicon. In any case, it is my thesis that, in spite of the variability of judgements about middles, it is

of affectedness based simply on `undergoing change' cannot account for verbs like `read'. The aspectual definition of affectedness subsumes a wider range of verbs with the appropriate syntactic behavior.

Verbs of motion whose direct arguments are delimiting paths appear to be somewhat problematic for this view, but on closer inspection they behave in the same way as `perform', `read' and `record'. The direct objects of the verbs below represent an area, distance or object which is traveled through in the course of the event described:

7

- a. cross the desert
- b. traverse the continent
- c. climb the mountain
- d. swim the Channel
- e. run a lap
- f. walk ten miles
- g. circumnavigate the globe
- h. infiltrate the enemy battalion

These may form middles in the author's judgement:

8

- a. The desert crosses more easily than the prairie for settlers with large wagons.
- b. Today the continent traverses in only four hours compared with the weeks or months it took a hundred years ago.
- c. That mountain climbs easily from the west side but it has never been attempted from the east.
- d. ?The Channel swims in fifteen hours for a swimmer in top condition.
- e. ?The last lap runs the hardest.
- f. ??Ten miles walks easily in good shoes.

-----  
the delimitability of the event through the the direct argument that is required by the grammar for middle formation to be possible.

- g. The globe circumnavigates in a day with Pan Am.
- h. The enemy battalion infiltrated surprisingly easily for the guerrilla soldiers.

The examples above are admittedly somewhat awkward, but comparable sentences with non-delimiting verbs are much worse:

9

- a. wander the desert
- b. travel the globe
- c. pursue the enemy battalion

10

- a. The prophet wandered the desert for forty years.
- b. John traveled the globe (over) until he ran out of money.
- c. The guerrillas pursued the enemy battalion.

11

- a. \*The desert wanders more easily than the prairie for settlers with large wagons.
- b. \*The globe travels easily with Pan Am.
- c. \*The enemy battalion pursued surprisingly easily for the guerrilla soldiers.

The verbs in 9 do not describe delimited events. They may take paths as direct arguments (as in 10) but the middles formed with these verbs (in 11) are much worse than those formed with the delimiting verbs (verbs describing delimited events) in 8.

Noun phrase passives show the same correlation of acceptability with delimitedness:

12

- a. The desert's crossing was inevitable, once gold was discovered on the other side.
- b. The continent's traversal takes five days.
- c. ?That mountain's climb will be attempted before its mapping has been completed.
- d. ??The Channel's swim is less of a problem than its traversal

- by sailboat.<sup>5</sup>
- e. ?One more lap's run is impossible.
  - f. Ten mile's walk was enough.
  - g. The globe's circumnavigation was impossible until sextants were developed.
  - h. The enemy battalion's infiltration was carried out at night without mishap.  
?The enemy battalion's infiltrating was carried out at night without mishap.<sup>6</sup>

Comparison of the noun phrase passives in 12 describing delimited events, with noun phrase passives in 13 describing non-delimited events shows a strong difference in acceptability:

13

- a. \*The desert's wandering was inevitable once gold was discovered on the other side.
- b. \*The globe's traveling was impossible until railways were developed.
- c. \*The enemy battalion's pursuit was carried out at night without mishap.  
\*The enemy battalion's pursuing was carried out at night without mishap.

The property of affectedness defined in this way through

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5. I do not have an explanation for why these particular zero-derived nominals are awkward in these constructions. It is probably related to the fact that these verbs have strong non-delimited readings that interfere with the less salient delimited reading required for noun phrase passives.

6. '-ing' nominals are somewhat more difficult to construe as noun phrase passives than many other nominals; '-ment' nominals, for example. This is possibly because '-ing' preserves the sense of ongoing action or process, whereas '-ment' signifies the completed action. '-ing' nominals may describe delimited events, but their delimited reading is not as salient as it is for '-ment' or '-tion' nominals. This may be the reason why '-ing' nominals make worse NP passives than '-ment' or '-tion' nominals.

delimitedness does not depend on the presence of an agent, and affectedness is not limited to the objects of transitive verbs. Compare 'Jefferson dies' with 'Jefferson swims'. A snapshot series over time of Jefferson's dying will be certain to have one distinctive snapshot in which Jefferson is fundamentally changed; he is dead. <sup>7</sup> Snapshots of Jefferson's swimming will have no such distinctive shot.

Affectedness depends only on the direct argument's ability to delimit the event. Verbs with unaffected arguments such as 'push' or 'swim' describe events that may acquire terminal points. Jefferson may tire of swimming or he may drown or the lake may freeze over. The cart may fall to pieces, or the road become impassable, and cart-pushing come to an end. Jefferson may swim only to the end of the lake, or the cart be pushed only to the end of the block. Prepositional phrases expressing a goal may be added to the verb phrase to delimit it:

14  
Jefferson swam to the end of the lake. (delimited)  
push the cart to the end of the block (delimited)

However, these terminal points are not inherent in the verb's direct argument as it participates in the event -- they are

-----  
7. This is independent of medical controversies over what constitutes death. However death is defined, there will be one point of time when it has arrived.

imposed externally. Verbs with affected arguments describe events that have their terminal points built into the verb and its immediate argument. These terminal points are interpreted with no additional qualifications. It is sufficient to observe the single argument, 'Jefferson' in 'Jefferson dies', or 'apple' in 'eat an apple' in order to tell when the event has come to an end.<sup>8</sup>

Verbs such as 'eat' and 'draw' have affected arguments which 'measure out' the event according to the objects' spatial extent. That property can provide an inherently finite scale against which to 'measure out' the event, and these events are consequently delimited whenever the object is itself finite. They naturally include verbs of consumption, creation, destruction, concealment, and enclosure. Verbs having direct objects that are themselves events, such as verbs of performance, will also be included in this group. These are a few examples:

15

eat, paint, translate, transfer, transmit, transpose,  
perform, disperse, publish, define, corral

These verbs form middles and noun phrase passives:

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8. The reader is reminded that affectedness is a linguistic property, and is therefore a property of events as they are organized and expressed by language. It is not a property of events in the world.

16

Apples eat easily, but I don't like pineapples because they're too much trouble to eat.<sup>9</sup>  
One apple's eating was all it took to break a tooth.

Homer translates easily.  
That poem's translation was a difficult undertaking.

Messages don't transmit easily to Mars.  
The message's transmission was delayed by mechanical problems.

According to the police, crowds disperse easily when it is raining.  
The crowd's dispersal was effected by the police.

Goats don't corral easily.  
That goat's corralling took three hours and a lot of rope.

This group also includes verbs that describe a change that travels through the object from one end to the other:

17

Hot bread cuts easily.  
We'd better leave the cake's cutting to Mary.

Dollar bills rip in half easily.  
The sail's ripping in half by the storm made the crew decide to turn back.

### 3.1.2 Verbs of change of physical state

The verbs of consumption and creation discussed in the previous section describe situations which are delimited by

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9. For speakers with more conservative judgements of middles, this sentence may improve if 'apples' is specified: 'One apple eats easily enough with dentures, but I don't think I could eat four of them without my own teeth.' Also consider the Campbell's soup commercial, noted by Van Valin (1987a): 'The soup that eats like a meal'. Nevertheless the fact remains that 'eat' and 'drink' do not form middles as readily as other verbs of consumption and creation. These verbs have peculiar properties for which I have no explanation.

the size or spatial extent of their direct arguments. With verbs such as these the `change' in the direct argument is final and absolute, and therefore delimiting. But `change' may also be relative change, in which case it is non-delimiting. Some verbs describe changes which are either absolute or relative, and so they may occur in verb phrases that are ambiguous between a delimited and a non-delimited reading. In the delimited reading, the verb names the state which is the final result of the change taking place in the direct argument. In the non-delimited reading, the verb simply names the property that is changing. `Burn' and `fade' are examples of such ambiguous verbs:

18

The fire last year burned the old oak tree.  
(The oak tree may have burned for awhile, or it may have been completely burned up.)

That old photograph faded in the attic trunk.  
(The photograph might have gone on fading indefinitely in the trunk, or it may be said to have reached the state where it is faded.)

Verb particles remove the ambiguity and select the delimited reading:

19

delimited or non-delimited:

- a. The fire last year burned the old oak tree.
- b. These children will grow taller.
- c. Your socks will dry on the radiator.

delimited:

- a. The fire last year burned down the old oak tree.
- b. These children will grow up.
- c. Your socks will dry out on the radiator.

Abusch (1986) discusses this type of ambiguity in inchoative verbs. Certain inchoatives that are related to adjectives may describe either delimited or non-delimited situations.

20 (Abusch 1986; her source, Partee p.c.)

- a. The weather has finally cooled.
- b. The weather has cooled considerably.

21

- a. The Atlantic Ocean widened in three decades.
- b. The Atlantic Ocean widened for three decades. (Abusch 1986)

20a is naturally understood as having an end-state or as being a delimited situation, while 20b has the implication of a relative change, or simply a non-delimited cooling process. The modifiers 'finally' and 'considerably' select for each of these readings. The expression 'in three decades' in 21a indicates a completed situation, or a delimited reading of the sentence, while 'for three decades' in 21b selects a non-delimited reading. Since the verb 'widen' may be used with either one, it may have either interpretation. This kind of ambiguity is described by Abusch as an ambiguity between a "become-adjective" (delimited) and a "become-adjective-er" (non-delimited) interpretation. Evidence for this view is provided by data such as the following. (Abusch, 1986):

22

- a. The Atlantic Ocean is wide and is widening.
- b. \*The Atlantic Ocean is wide and becoming wide.
- c. The Atlantic Ocean is wide and becoming wider.

22a has an interpretation in which the verb 'widen' describes

an ongoing process of change rather than an absolute change of state. `Widen' in this reading describes a non-delimited situation, and is paraphrased by 22c rather than 22b.

`Becoming wide' in 22b is an expression describing a delimited situation, because the adjective `wide' provides an absolute endpoint to the change. Once something is wide it cannot continue to achieve wide-ness, hence the ungrammaticality of 22b. This is the reason why, in 22a, `widen' is forced to have the non-delimited interpretation. However, `becoming wider' in 22c describes a non-delimited situation, because `wider' is not an absolute state. There is no absolute endpoint for the event at which `wider-ness' is achieved.

Furthermore, Abusch notes (her source, Partee, p.c.) that certain modifiers can distinguish between the "become-adjective" and become-adjective-er" readings of inchoative verbs. (Abusch 1986)

23		
<u>Adjectives</u>	<u>Comparatives</u>	<u>Inchoatives</u>
a.*a lot cool	a lot cooler	has cooled a lot
*quite a bit cool	quite a bit cooler	has cooled quite a bit
*ten degrees cool	ten degrees cooler	has cooled ten degrees
b. completely cool	*completely cooler	has cooled completely
absolutely cool	*absolutely cooler	has cooled absolutely

All the modifiers in 23 occur with inchoatives. The modifiers in 23a, which also occur with comparatives, select for the "become-adjective-er" or non-delimited reading. The modifiers

in 23b, which express some absolute degree and do not occur with comparatives, select for the "become-adjective", or delimited reading, of the inchoative.<sup>10</sup>

Recall that 'for' durative adverbials may be used as tests for delimitedness. These durative adverbials take semelfactive readings with non-delimited sentences, and repetitive readings with delimited sentences. The data below shows that 'quite a bit' selects a non-delimited reading, and 'completely' selects a delimited reading:

24

- a. The Mid-Atlantic Ridge cooled a lot/quite a bit for fifty years.
- b. \*The Mid-Atlantic Ridge cooled completely for fifty years.

24a can be understood as one event of cooling, while 24b must be interpreted as many events of cooling. Since this reading is incompatible with the pragmatics of the situation, the sentence is unacceptable.

On this basis, these two classes of modifiers can be used as tests for delimitedness. Consider the following four verbs: 'tighten', 'split', 'open', and 'spin'. With an unaccusative reading, both classes of modifiers may occur with each verb. For this test, consider only the reading in which the modifier

-----

10. Degree modifiers do not all fall into one of these two classes. Abusch lists the following degree modifiers that may not occur with either comparatives or inchoatives: 'very', 'quite', 'so', 'pretty', and 'rather'.

applies to a single event, rather than a generic repetition of events.

25

- a. The cinch tightens a lot/quite a bit/completely.
- b. The woods splits ?\*a lot/?quite a bit/completely.<sup>11</sup>
- c. The door opens a lot/quite a bit/completely.
- d. The wheel spins a lot/quite a bit/completely around.

Consider these familiar middles once more. (Example 26 is from Hale and Keyser (1987)):

26

- a. The cinch tightens easily.
- b. The wood splits easily.
- c. The door opens easily.
- d. The wheel spins easily.

When the two kinds of modifiers are applied to the middles in 26 a difference emerges. Although all the examples below are stylistically awkward and somewhat unnatural, there is a clear difference in acceptability between the sentences in 27 and 28. Those in 27 with modifiers that select for non-delimitedness are much worse than those in 28, with modifiers that select for delimitedness.<sup>12</sup>

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11. 25b is odd with 'a lot' and 'quite a bit' for independent reasons. 'Splitting' has a strong tendency to be interpreted as happening nearly instantaneously. It is consequently difficult to get these modifiers to modify the single event of splitting. In the author's judgement it is possible, though awkward, to get this interpretation with 'quite a bit'. This will be the adverbial expression that is used with 'split' in the examples that follow.

12. (1) A modifier like 'ten degrees' is omitted from 27 for two reasons. Its effect on acceptability is inconsistent, and

27

- a. ?\*The cinch tightens a lot/quite a bit, easily.
- b. ?\*The wood splits quite a bit, easily.
- c. ?\*The door opens a lot/quite a bit, easily.
- d. ?\*The wheel spins a lot/quite a bit, easily.

28

- a. The cinch tightens completely, easily.
- b. The wood splits completely, easily.
- c. The door opens completely, easily.
- d. The wheel spins completely around, easily.

Now consider the following noun phrase passives. They include both middle-forming verbs (a-d) and pure unaccusative verbs (e-f).

29

- a. The cinch's tightening was difficult.
- b. The wood's splitting was difficult.
- c. The door's opening was difficult.
- d. The wheel's spinning was difficult.
- e. The lake's evaporating was a surprise.
- f. The ice's melting was a surprise.

The two unaccusative examples above may be used with either set of modifiers:

30

The lake evaporated a lot/quite a bit/completely.  
The ice melted a lot/quite a bit/completely.

-----  
it seems to have the ability to convert a non-delimited sentence into a delimited one: `\*It cooled ten degrees for three hours' versus `It cooled ten degrees in three hours'. The other modifiers in this group do not affect the non-delimitedness of the sentences they apply to. (ii) `Absolutely' is omitted from 28 because it is unnatural with these particular verbs. Insofar as it can be used with these verbs, in the author's judgement it behaves the in the way same as `completely'.

When the two classes of modifiers are applied to these noun phrase passives, the same distinction emerges:<sup>13</sup>

31

- a. ?The cinch's tightening a lot/quite a bit was difficult.
- b. ?\*The wood's splitting a lot/quite a bit was difficult.
- c. ?\*The door's opening a lot/quite a bit was difficult.
- d. ?The wheel's spinning a lot/quite a bit was difficult.
- e. ?\*The lake's evaporating a lot/quite a bit was a surprise.
- f. ?\*The ice's melting a lot/quite a bit was a surprise.

32

- a. The cinch's tightening completely was difficult.
- b. The wood's splitting completely was difficult.
- c. The door's opening completely was difficult.
- d. The wheel's spinning completely around was difficult.
- e. The lake's evaporating completely was a surprise.
- f. The ice's melting completely was a surprise.

Further evidence for the delimitedness of noun phrase passives is adduced by comparing '-ing' nominals having the direct argument in specifier and complement positions:

33

- a. the cooking of the stew
- b. the stew's cooking

33a, which has the direct argument 'stew' in complement position, may be understood to mean a delimited or non-delimited event of cooking. 33b, a noun phrase passive with the object in specifier position, can only be interpreted as delimited. When the adverbial expressions 'in an hour' and

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13. The difference between 31 and 32 is even more pronounced when a-d are unaccusative. Substituting 'was a surprise' for 'was difficult' improves 31. Using unaccusative verbs abstracts away from complicating factors in middle formation.

`for an hour', which distinguish between delimited and non-delimited expressions, are applied to 33b above, different structures result:

- 34
- a. {<sub>NP</sub>[the stew's] [[cooking] [in an hour]]}
  - b. {<sub>NP</sub>[the stew's] [[cooking] [for an hour]]}
  - c. {<sub>NP</sub>[the stew's] [cooking]} [in an hour]
  - d. \*{<sub>NP</sub>[the stew's] [cooking]} [for an hour]

The ungrammaticality of 34d is even more pronounced with the determiner `several'<sup>14</sup>:

- 35
- \*{<sub>NP</sub>[several stews'] [cooking]} [for an hour]

`In an hour' applies to a delimited expression to yield another delimited expression. `For an hour' applies to a non-delimited expression, but changes it to a delimited one. The structure in 34d and 35 is impossible because it forces a non-delimited reading of the specified NP.

Verbs that are ambiguously interpretable as describing delimited or non-delimited situations describe delimited situations when they occur in noun phrase passives.<sup>15</sup> `Widen'

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14. This was suggested by a comment of Barry Schein's.

15. `-ing' is a nominalizing morpheme that preserves the delimited/non-delimited ambiguity. There are some nominalizing morphemes that do not; `-tion' for example, requires a delimited interpretation of the event represented

and 'reddden' are two examples. In 36 and 37 below, the a) and b) examples show no difference in acceptability when the adverbial expressions 'in an hour' and 'for an hour' are applied. The noun phrase passives in the a) and b) sentences, on the other hand, do show such a difference. Applying the adverbial 'for an hour' makes the sentence awkward. This is because 'for an hour' forces a delimited expression to be interpreted as repetitive, and a repetitive reading is not easily imposed on the situations described in these sentences:<sup>16</sup>

36

- a. The federal official said that the highway's widening in a year would be impossible.
- b.?The city official said that the highway's widening for a year would be a nuisance.
- c. The federal official said that the widening of the highway in year would be impossible.
- d. The city official said that the widening of the highway for a year would be a nuisance.

37

- a. The western sky's reddening by air pollution in an hour never happened before.
- b.?The western sky's reddening by air pollution for an hour

-----  
by the nominalized predicate.

16. Some speakers do not allow NP passives formed by '-ing' nominalizations of verbs like 'widen'. For these speakers 36a and 36b will be bad sentences. These speakers should get the corresponding difference between: 'the bypass' extension in a year' and 'the bypass' extension for a year'.

never happened before.<sup>17</sup>

- c. The reddening of the western sky by air pollution in an hour never happened before.
- d. The reddening of the western sky by air pollution for an hour never happened before.

Nominalized '-ing' nouns with subjects marked by genitive case do not have to form delimited expressions:

38

- a. John's trusting of the landlord (for a month/\*in a month) got him into trouble.
- b. Harry's smoking (for a month/\*in a month) is making him sick.

Change of state verbs like those discussed in this section, which may be ambiguous between a delimited and a non-delimited reading, select the delimited reading when they occur in middles and noun phrase passives. This fact is not captured by the view of affectedness as depending solely upon some change in the direct argument. The correct generalization requires making the distinction between delimited and non-delimited change.<sup>18</sup>

Verbs of consumption and creation like 'eat' or 'draw' and change of state verbs such as those above describe situations

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17. The interpretation looked for here is that in which the reddening process is continuing for an hour, not the result of the reddening process.

18. Roberts' (1985) definition of the change required by affectedness does in fact express a delimited change.

that are delimited through the direct argument. However, the way the direct argument delimits the event is slightly different in the two types of verbs. Verbs of consumption or creation describe events that progress through the object physically, so that the finite spatial extent of the object translates directly into the delimitedness of the event. With a change of state verb describing a delimited event, the endpoint is not necessarily achieved by progressing through the object. How the action progresses through the spatial extent of the object may be pragmatically interpreted. All parts of the object may achieve the change of state incrementally; or the new state may be arrived at over the entire object at once; or some combination of both possibilities may be true. The verb 'ripen' is an example. A piece of fruit may ripen gradually from one end to the other; or all parts of the fruit may ripen at an equal rate; or there may be stretches of time when different parts of the fruit are all ripening at the same rate, and stretches of time when they are not. 'Tan' is another example. 'Tanning the skin' usually means tanning different parts of the skin at equal rates, but some parts may tan faster than others depending on the orientation of the sun, and the changing shadows. With consumption/creation verbs and with change of state verbs, it is not the spatial extent of the object which is 'measuring out' the event but some property central to the verb's meaning which is associated with the object.

The metaphor of the measuring scale applies to these verbs as it does to verbs of creation and consumption. How the scale of ripeness or tanness is applied to the event is pragmatically determined, but what scale is to be applied is specified in the lexical entry of the verb. Some property central to the meaning of the verb becomes the scale that 'measures out' the event. With the verb 'ripen' it is the property of ripeness, and with the verb 'tan' it is the property of tanness that 'measures out' the event.

### 3.1.3 Verbs of abstract changes of state

Some verbs describing abstract changes of state also belong in the class of affectedness verbs. These verbs may be characterized in the same way as verbs expressing physical changes of state. Three examples are, 'persuade', 'confirm' and 'bribe'. They participate in the middle and noun phrase passive constructions:

39

- a. Robert persuades easily. I talked him into buying a widget.
- b. The Congressman's persuasion by the trade representatives turned the decision in their favor.
  
- a. Candidates nominated by the President confirm easily in this administration.
- b. The applicant's confirmation by the panel was finalized.
  
- a. City officials bribe easily.
- b. The mayor's bribing by the tycoon made big news.

19 The direct argument of an abstract affectedness verb delimits the event, because the event is complete once the direct argument has arrived at the new state. Persuading Robert or confirming the applicant lasts until Robert is persuaded and the applicant confirmed. In the delimited reading of 'bribe', the act of bribing an official is over when the official has accepted the bribe, not when the briber has offered it. Abstract change of state verbs like these are encompassed in the aspectual definition of affectedness.

#### 3.1.4 Achievement verbs

Many verbs with affected arguments can be characterized as describing situations that are measurable over a certain time interval along a scale provided by some property of the object argument. These are accomplishment verbs, in Vendler's terminology. However, there are other verbs with affected arguments that seem to describe events with little or no duration over time. These are Vendler's achievement verbs.

40

Glass breaks easily.

The glass' breaking made a terrible noise.

Bombs explode easily.

The bomb's exploding closed down the state offices.

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19. These verbs are not generally ambiguous in the way that physical change of state verbs are, although in the judgement of the author 'bribe' is ambiguous between a delimited and a non-delimited reading.

Recall the discussion in Chapter 1 in which it is argued that the distinction between achievement and accomplishment verbs is not grammatically significant. It is delimitedness that is grammatically important -- not duration. If the event is one in which the argument undergoes a change of state, that event has some duration, however little, merely because there can be no change of state without a before and after. Even though an interpretation is strongly favored in which the temporal duration of the event is minimalized, the durative quality of such an event is never completely eliminated. The verb 'explode' is an example. Like 'eat', 'explode' takes an affected object. It appears to differ from 'eat' in that an event of something exploding usually happens in an instant, while an event of eating something has duration. Although an explosion normally takes an instant, the explosion of a supernova may take millions of years. 'Crack' is another such verb. Cracking a pane of glass takes only an instant but cracking the bough of a tree can take a certain amount of time.<sup>20</sup>

Achievement verbs, therefore, describe events as having some duration, however little. The events they describe take some

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20. The reader is again reminded that it is the linguistic representation of events that is under discussion here; that is, events as they are organized and represented by language -- not events as they are in the world.

finite amount of time to transpire. The endpoint of that time period is registered in the direct argument -- e.g., the cracked or exploded object. The aspectual definition of affectedness based on delimitedness unites achievement verbs with accomplishment verbs. A verb's lexical entry specifies whether the verb describes an event as having extended duration or little or no duration. There may be considerable lexical variation among speakers of the same language, and a speaker's lexicon may be influenced by the speaker's knowledge or perception of the world. The difference between accomplishment and achievement verbs is a lexical difference without deep grammatical significance.

### 3.1.5 Verbs of motion

Even though the direct argument of a verb of motion does not seem to delimit the event described by the verb, certain verbs expressing motion caused by an agent may form middles:

41

- a. Lorenzo pushes the cart.
- b. This cart pushes easily.

- a. Olga gallops the horse.
- b. This horse gallops easily.

The a) forms illustrate the verbs in their regular transitive usage and the b) forms illustrate the verbs used as middles. Many verbs of motion in the middle usage often have a peculiar inceptive interpretation. For many speakers the b) sentences above actually mean 'this cart starts to push easily' and

`this horse starts to gallop easily'. An inceptive interpretation of these sentences is forced by the delimitedness constraint on middle formation. Verbs of motion used in middles are actually used as change of state verbs. That is, the moved object undergoes a change of state from being an unmoving object to being a moving object. In these cases, the direct argument -- the moved object -- is what delimits the situation.

Verbs of motion used in the middle construction must have a delimited interpretation. If it is not an inceptive interpretation as above, it will be a completive interpretation.<sup>21</sup> As tests for delimitedness we can compare a goal phrase and the expression `a little ways'. The goal phrase in 42a, `to the other side', selects a delimited interpretation while the expression `a little ways' in 42b selects a non-delimited reading. Since `cross the desert' describes a delimited event, only the goal phrase `to the other side' may co-occur with it. `A little ways' makes the sentence bad:

42

- a. cross the desert to the other side
- b. \*cross the desert a little ways

When this test is applied to verbs describing events of

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21. Many speakers only get one or the other reading (inceptive or completive), but not both.

imparting motion such as `heave', `herd', `drive' or `push', it is apparent that they describe completely delimited events when they are used as middles:

43

- a. Mary heaved the boulder (into the ditch/a little ways).
- b. Boulders heave more easily than logs (into the ditch/\*a little ways).
  
- a. Sarah herded/drove the cattle (to the stockyards/a little ways).
- b. Cattle herd/drove more easily than goats (to the stockyards/\*a little ways).
  
- a. John pushed the cart (to Texas/a little ways).
- b. The cart pushed easily (to Texas/\*a little ways).

Verb-of-motion noun phrases with genitive subject arguments should not be confused with noun phrase passives. Verbs of motion that have true intransitive uses may appear to form noun phrase passives when in fact they do not. 44 is an example:

44

- a. The horse's galloping down the road woke up the farmer.
- b. The horse gallops.
- c. The soldier gallops the horse.

44a is acceptable as a sentence describing a non-delimited event because it is derived from 44b rather than 44c. `The horse' in 44a is not a deep structure object (direct argument) of `gallop'. Non-delimited constructions like 44a are acceptable when the arguments are external arguments (deep structure subjects).

Verbs of motion in true noun phrase passives are variable in

acceptability. They improve somewhat if the situation described by the verb is understood as delimited:

45

- a. \*The cart's pushing along the river slowed down the infantry.
- b. ??The cart's pushing over the hill slowed down the infantry.

### 3.1.6 Affectedness as an aspectual property

Investigation of the lexical semantics of five different verb classes demonstrating the syntactic behavior typical of affectedness verbs has shown that the semantic characteristic associated with this syntactic behavior is more adequately defined in terms of aspectual delimitedness, than simply as 'affectedness'. These five verb classes share the characteristic that they describe events in which the referent of the direct object is capable of delimiting the event. Some property of the direct object, central to the verb's meaning, is designated as 'measuring out' the event. Whether the event described has some extended duration or little or no duration is irrelevant. The five verb classes are summarized in the

table below:

Verb class	Example of verb with direct object	Property of direct object that delimits event
Verbs of creation or consumption	eat an apple draw a circle translate a pcm	size or spatial extent
Verbs with event objects	perform a play play a sonata	spatial or temporal extent
Verbs of motion with delimiting paths	cross the desert	spatial extent
Verbs expressing physical change of state	ripen the fruit tighten the cinch	ripeness tightness
Verbs expressing abstract change of state	bribe the official	bribed-ness
Achievement verbs	explode the bomb	exploded-ness
Verbs of motion	push the cart	i. state of being in motion ii. finite distance moved

### 3.2 Lexical entries for affectedness verbs

The special properties of affectedness verbs must be marked in the lexicon. Aspectual information about the verb will be one part of the verb's lexical entry. This aspectual information takes the form of a function associated with the verb, that maps the direct argument into a two part value: a change on some scale derived from some property of the object,<sup>1</sup> and an interval of time. The function is represented as follows:

$$A_{\text{verb}}^{\text{46}}(\text{direct argument}) = (\Delta S, \Delta t)$$

The scale may be finite or non-finite. Whether the scale is finite, non-finite, or may be either, depends on the verb's aspectual function. The scale associated with affectedness verbs may be finite; those associated with non-affectedness verbs may not be finite.<sup>2</sup> The finite scale is selected when

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1. How that scale is derived may require a disjunct statement, depending on whether the spatial extent of an object is to be considered a property of that object in the same sense that ripeness or wide-ness is a property of an object.

2. Within the class of affectedness verbs there may be variation as to whether the scales are always finite, or have a finite/non-finite option. Affectedness verbs are distinguished because the  $\Delta S$  associated with the aspectual function is finite. Change of state verbs like 'ripen' or 'widen', whose  $\Delta S$  is determined by the change in some property of the object, may be associated with scales that are inherently finite, because the property names a final state.

(i) the verb has that option and (ii) the direct argument is spatially delimited. (This will be discussed further in section 3.3.1.) The finiteness or non-finiteness of the scale will be represented by the following annotations:  $\Delta^{fin}S$  for a finite scale and  $\Delta^nS$  for a non-finite scale. If  $\Delta S$  is finite,  $\Delta t$  will also be finite.

47 below represents the aspectual functions associated with the verbs 'eat', 'ripen' and 'explode', in the verb phrases 'eat an apple', 'ripen a fruit', and 'explode a bomb':

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However, verbs whose  $\Delta S$  is determined by a change in the spatial extent of the object seem to have both delimited and non-delimited readings. For example, in (a) below 'climb the beanstalk' describes a delimited event, while in (b) it describes a non-delimited event:

- a. Jack will climb the beanstalk in a day.
- b. Jack will climb the beanstalk forever.

However, in environments where delimitedness is required, such as NP passivization, the reading in which the event goes on forever is not available:

??Jack's climbing of the beanstalk forever will be an amazing sight.

Jack's climbing of the beanstalk in a day will be an amazing sight.

If these differences between verbs like 'ripen' and verbs like 'climb' are real, then the aspectual function of a verb must be represented with a notation determining whether the scale must be finite, must be non-finite, or may be finite or non-finite. Verbs of change of state belong in the first class, verbs of change of location in the second class, and verbs of creation and consumption in the third class. This is an issue that requires further research.

$A_{\text{eat}}(\text{an apple}) = (\Delta^{\text{fin}} \text{ spatial extent of apple}, \Delta t)$

$A_{\text{ripen}}(\text{a fruit}) = (\Delta^{\text{fin}} \text{ ripeness of fruit}, \Delta t)$

$A_{\text{explode}}(\text{a bomb}) = (\Delta^{\text{fin}} \text{ explodedness of bomb}, \Delta t).$

The size of the interval  $\Delta t$  will vary depending on the verb. An accomplishment verb will produce a value for  $\Delta t$  that is an interval of some duration, but an achievement verb will have a  $\Delta t$  that is a very small interval, or perhaps a single point of time.<sup>3</sup> If  $\Delta t$  is a single point of time,  $\Delta S$  will be collapsed into a point, rather than 'spread out' over some interval. Consequently, evidence for  $\Delta S$  will be harder to find for these verbs.<sup>4</sup>

The property that is associated by a verb with change over time also depends on the verb. The verb specifies some property central to its meaning, by which its direct argument 'measures out' the event. In some cases the property depends jointly on the verb and its direct argument. The verb 'watch' with a direct argument that represents an event uses the

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3. I am bypassing the question of whether time is represented in natural language as a succession of points or of intervals.

4. One important feature about  $\Delta S$  has been presented as being the fact that it can be described as a gradient. I leave it as an open question as to whether there are degenerate cases of verbs that collapse  $\Delta S$  into a single point of change. Verbs with sources or goals as external arguments are possible representatives of such a class. (More on this in section 4.3.1.) Even in these cases another important feature of  $\Delta S$  is maintained: the change is describable as a change in a single parameter.

temporal extent of the argument, as in 'watch a movie'. If the direct argument is not an 'event object' the argument is unaffected and the event is non-delimited, as in 'watch a bird'.

This property has a very important characteristic; it is measurable on a scale. This is clearly true of a property such as spatial extent, which is indicated by verbs of consumption or creation; and the property of distance moved, which may be specified by verbs of motion. However it is also true of the properties associated with verbs expressing changes of state, and achievement verbs. If some property of the direct argument of a verb-expressing a change of state is 'measuring out' the event like a scale, it must be a property that may be measured in degrees. A scale is made up of discrete unit parts that are equal in value to one another, and which can be ordered with respect to each other. The interpretation of some adverbs and comparatives depends on these characteristics of a scale. Adverbial phrases with a comparative may refer to increments of these properties:

48

This banana ripens more every day.  
Open the door a little more.  
Unfold the paper a little wider.  
Don't tan your skin so much.  
Let the papaya ripen a little more.  
Bend the bow a little more.  
Tighten the cinch a little more.  
Loosen your belt a little.  
Lengthen the rope a little more.  
Shorten the rope a little.  
Redden the image a little more.

Close the door a little more.

Because the property is measurable on a scale, it may be represented as not quite achieved:

49

This apple is not quite ripe.

This branch is not quite broken. (I can't pull it off yet.)

The barn is almost collapsed, but still standing.

A partially exploded bomb was found in the train station.

Time, in the way we perceive it, also has a natural scale. It can be divided up into unit intervals, and its directionality allows the intervals to be ordered with respect to one another. The complex value yielded by the aspectual function is therefore an association of two scales. I suggest that this value associating the change in a property of the direct argument with the interval of time over which that change transpires, is the linguistic representation of an event.<sup>5</sup> The unit event is defined linguistically through a verb and its direct argument.

It is the association of the change in property with a change in time that is modified by rate adverbials:<sup>6</sup>

50

Greenhouse managers in Wisconsin ripen bananas slowly.

A bomb will explode slowly on slow-motion film.

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5. Kuhn(1981) points out that Aristotle had a similar notion of events as change over time.

6. Richard Larson brought my attention to the relevance of rate adverbials for this theory.

The composition of the aspectual function of a verb mirrors the syntactic composition of a a verb with its direct argument. Just as the verb takes its direct argument and maps it into a verb phrase in the syntax, the verb's aspectual function takes the direct argument and maps it into an event. The verb phrase is the locus of the linguistic representation of an event.<sup>7</sup>

### 3.3 Affectedness and the compositionality of delimitedness

#### 3.3.1 The translation of spatial delimitedness into temporal delimitedness

Affectedness verbs have the property that they describe an event in which the direct argument of the verb is capable of delimiting the event. The delimitedness of an event described by an affectedness verb and its direct argument depends not only on the lexical semantics of the verb, but on certain properties of the direct argument of the verb. In this sense delimitedness is compositional. Affectedness verbs have the special property that they allow the count/mass distinction in the direct argument to be translated into a delimited/non-delimited distinction in the verb phrase or

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7. This view suggests that if there is an event position in the argument structure of a verb, as suggested in Davidson (1966) and Higginbotham (1985, 1986), it is associated with the VP rather than with the verb.

sentence. The delimitedness of the events described by the sentences below depends on the direct objects:

51

- a. Dustin ate an apple (?for an hour/in an hour). (delimited)
- b. Dustin ate snow (for an hour/??in an hour). (non-delimited)

The difference between 51a and 51b is due to the object of the verb. If Dustin eats an apple, he finishes eating when the apple is gone, but if he eats snow, he continues eating for an indefinite period of time. He may even eat it forever if he is in a world that never runs out of snow. The property of noun phrases that contributes to the delimitedness of a verb phrase is that of being spatially delimited. The noun phrase 'an apple' is a count term, and therefore refers to something that is spatially delimited. The noun phrase 'snow' does not. An object or material that is spatially delimited has some fixed quantity. Count nouns ('apple') describe things that have clear boundaries and can be counted. Mass nouns ('snow') describe things that are undefined in extent. They must be measured rather than counted. Bare plurals are the same as mass nouns in this respect:<sup>8</sup>

52

- Dustin ate apples (for an hour/??in an hour). (non-delimited)

Affectedness verbs are capable of translating the spatial

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8. Also see Carlson (1977) for discussion.

delimitedness associated with the noun phrase that is their direct argument into the temporal delimitedness associated with the verb phrase. Spatial and temporal delimitedness are parallel in many respects. A temporally delimited event has a fixed duration, even if that duration is unknown. A spatially delimited object or material has some fixed extent in space, even if that extent is unknown. In the sentence 'Dustin will eat an apple' the spatial delimitedness of the single apple translates into the temporal delimitedness of an event of eating a single apple.

The fact that affectedness verbs are capable of translating the spatial delimitedness of their direct arguments into the temporal delimitedness of the verb phrase distinguishes them from verbs that do not have affected arguments. The verbs in 53 below are affectedness verbs. The events they describe are temporally delimited because the direct objects are spatially delimited:

- |    |                       |             |
|----|-----------------------|-------------|
| 53 |                       |             |
| a. | eat an apple once     | (delimited) |
| b. | eat one apple         | (delimited) |
| a. | draw a circle once    | (delimited) |
| b. | draw one circle       | (delimited) |
| a. | ripen the fruit once  | (delimited) |
| b. | ripen one fruit       | (delimited) |
| a. | perform the play once | (delimited) |
| b. | perform one play      | (delimited) |
| a. | break the window once | (delimited) |
| b. | break one window      | (delimited) |

- |                            |             |
|----------------------------|-------------|
| a. bribe the official once | (delimited) |
| b. bribe one official      | (delimited) |
| a. open the door once      | (delimited) |
| b. open one door           | (delimited) |

In the a) examples the event described by the verb phrase is quantified with the frequency adverbial 'once'. This makes the verb phrase event clearly delimited, and provides a standard against which to compare the b) examples. In the b) examples, the numerical quantifier 'one' is responsible for the spatial delimitedness of the direct object noun phrase. The a) and b) examples together form minimal pairs in which the quantification is either over the verb phrase event or over the noun phrase object. Although the a) and b) examples are not necessarily paraphrases of each other, they are equally clearly delimited.

Investigation of three classes of verbs with unaffected objects demonstrates that they do not share this property of translating spatial delimitedness into temporal delimitedness. These three classes fall out from considering separately the properties of the verb's internal and external arguments. The crucial parameter is whether there is change, motion or activity in one or both of these arguments during the course of the situation or happening described by the verb. For clarity of exposition these classes are discussed under I through III in the following paragraphs.

I. Consider first the stative verbs. They describe

situations in which no change, motion or activity occurs in either the internal or external argument, while the situation described by the verb lasts. Stative verbs describe situations in which there is no motion, change or activity at all. This is the reason why statives only occur in non-delimited verb phrases:

54	
like mathematics	(non-delimited)
resemble your cousin	(non-delimited)
expect an arms shipment	(non-delimited)
see the forest	(non-delimited)
be red	(non-delimited)

The situations described by the verbs in 54 are non-delimited. Applying a frequency adverbial like 'once' makes the expression odd, unless 'once' is understood in a different sense from that in the preceding examples under 53. The salient reading of 'once' in the examples below is 'at some time in the past'. The expressions are odd if 'once' is interpreted in the sense of 'one event of \_\_ing'.

55  
?like mathematics once  
?resemble your cousin once  
?expect an arms shipment once

Where 'once' can be interpreted to mean 'one event of \_\_ing', it does not force a delimited reading of the expression:<sup>9</sup>

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9. This is even clearer with the frequency adverbial 'twice', which avoids the ambiguity of 'once': 'see the forest twice', 'be red twice'

56

see the forest once  
be red once

(non-delimited)  
(non-delimited)

Quantifying the noun phrase object with the specifier 'one'  
does not make the expression delimited:

57

like one branch of mathematics  
resemble one cousin  
expect one arms shipment  
see one forest

(non-delimited)  
(non-delimited)  
(non-delimited)  
(non-delimited)

II. The second class of verbs with unaffected direct arguments are verbs that describe situations in which there is change, motion or activity on the part of the external argument but not the internal argument; and the action performed by the external argument does not progress through the spatial extent of the internal argument as it does with verbs such as 'eat' or 'perform'. These verbs, like the statives, occur only in non-delimited expressions. (There are exceptions of a very particular nature, discussed under III below.)

58

watch a peregrine falcon  
remember the past  
observe the magnetometer

(non-delimited)  
(non-delimited)  
(non-delimited)

Neither quantifying over the verb phrase event with 'once' or over the noun phrase object with 'one' makes the expression delimited:

59  
 watch a peregrine falcon once (non-delimited)  
 remember the past once (non-delimited)  
 observe the magnetometer once (non-delimited)

60  
 watch one peregrine falcon (non-delimited)  
 remember one thing in the past (non-delimited)  
 observe one magnetometer (non-delimited)

III. There are some verbs that have unaffected arguments but can appear in verb phrases expressing delimited events. The adverbial 'once' selects the delimited reading of the verb phrase. However, the quantifier 'one' applied to the object noun phrase does not select the delimited reading:

61  
 a. tap the wall once (delimited)  
 b. tap one wall (delimited, non-delimited)  
 a. hit the wall once (delimited)  
 b. hit one wall (delimited, non-delimited)  
 a. beat the wall once (delimited)  
 b. beat one wall (delimited, non-delimited)  
 a. wave your hand once (delimited)  
 b. wave one hand (delimited, non-delimited)  
 a. poke the cat once (delimited)  
 b. poke one cat (delimited, non-delimited)  
 a. kick the door once (delimited)  
 b. kick one door (delimited, non-delimited)

For the verbs in 61 above, quantifying over the verb phrase event results in a clearly delimited expression, but quantifying over the noun phrase object does not. These expressions are delimited by an inherent subdivision of the action of the external argument into units. These verbs readily form corresponding nominals describing events (a wave,

a kick, a tap, a hit, a jump, etc.). The events they describe are not delimited by the internal argument, and they may easily be understood as repetitive. This means the verbs are inherently ambiguous between a delimited and non-delimited interpretation. (This is particularly clear with `tap', `beat' and `wave' in 61 above.) When the event described by the verb is delimited by the internal argument, the repetitive reading is not the salient one.

This is not to say that a verb with an affected argument may not express a repetitive event.<sup>10</sup> A repetitive interpretation of the event described is possible with the proper frequency adverbials. All the expressions in 62 and 63 below, which have affected and unaffected objects respectively, express non-delimited, repetitive events:

62		
draw one circle again and again		(non-delimited)
open one door many times		(non-delimited)
63		
hit one wall again and again		(non-delimited)
wave one hand many times		(non-delimited)

However, when there are no frequency adverbials in the verb phrase to force a repetitive reading, only the verb phrases with affected objects can translate the spatial delimitedness of the direct object into the temporal delimitedness of the

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10. The term `event' is used here to apply to many repetitions of the same event, as well as a single, non-repeated event.

event.<sup>11 12</sup>

### 3.3.2 Parallels between the count/mass and delimited/non-delimited distinctions

The parallelism between the count/mass and the delimited/non-delimited distinctions is brought out by certain

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11. The observant reader will have noticed a gap in the paradigm of possible verb classes. There are no verbs in which there is motion, change or activity in the internal argument, but not in the external argument. This would be, for example, a hypothetical verb 'see-run' that could express what the two verbs together express in 'see John run', where 'see' is non-volitional and non-agentive. I do not believe this is an accidental gap, but as yet I have no explanation for it.

12. Affectedness verbs are distinguished from other verbs by the fact that they are capable of translating the spatial delimitedness of their direct arguments into the temporal delimitedness of the event they describe. However, there is an open question as to whether they must necessarily do so. This is because of the possible ambiguity introduced by the repetition of events. If the property designated by the affectedness verb is that of spatial extent, the correlation between count/mass and delimited/non-delimitedness will be direct. 'Eat snow' can refer to eating a definite amount of snow an indefinite number of times, or eating an indefinite amount of snow at one sitting. Only in the second reading is spatial extent actually translated directly into temporal delimitedness, but both express non-delimited events. If the property invoked is something else besides spatial extent, only in the first of these interpretations must spatial delimitedness be translated into temporal delimitedness. 'Redden snow' can refer to reddening a definite quantity of snow an indefinite number of times, or reddening an indefinite quantity of snow once. In the latter case, if the reddening does not progress from one 'end' of the snow to the other (assuming we have some snow with 'ends'), but affects the snow equally all over, the event will be delimited. This would be an instance of the combination of a mass direct argument with an affectedness verb to yield a delimited event. I am not clear on the validity of these judgments. This issue needs further research.

tests. There are many tests for distinguishing count and mass nouns. Hinrichs (1985) lists the following four:

i) Co-occurrence restrictions on quantifiers: Different sets of quantifiers are associated with count and mass nouns. Quantifiers like 'each', 'every', and cardinal numbers may occur only with count nouns, and words like 'little' and 'much' with mass nouns:<sup>13</sup>

64	
each apple	*each snow
every apple	*every snow
three apples	*three snows
*little apple	little snow
*much apple	much snow

Likewise, the modifiers of degree discussed in section 3.1 co-occur either with sentences describing delimited events or with sentences describing non-delimited events. The examples below are repeated from section 3.1:

- 64
- a. ?\*The cinch tightens a lot/quite a bit, easily.
  - b. The cinch tightens completely, easily.<sup>14</sup>

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13. This is not to say that mass nouns may not be reinterpreted as count nouns and vice versa. If snow is understood to mean 'a snowfall' one may say, "We've had three snows in January". And if apple is reinterpreted to mean 'essence of apple', it may be said, "There's too much apple in this fruit flavor".

14. A clearer example of a middle was suggested by Ken Hale: 'The cinch won't tighten completely.'

The sentences in 64 above are middles, and so must have delimited interpretations. The expressions 'a lot' and 'quite a bit', which co-occur with sentences describing non-delimited events, are unacceptable in 64a; while 'completely', which co-occurs with sentences describing delimited events, is acceptable in 64b.

ii) Singular/plural modification: Count nouns may be singular or plural, whereas mass nouns only occur in the singular:

64		
apple		snow
apples		*snows

Recall that a durative adverbial forces an iterative reading only on expressions describing delimited events, not expressions describing non-delimited events. The iterative interpretation is, in a sense, a plural for events.

The next two properties of mass terms having to do with closure of reference have been applied to the delimited/non-delimited distinction by several authors.

iii) Cumulative reference: The sum of two denotations of a mass term is in the denotation of that term. This is not true for count nouns. If I have snow in my left hand and snow in my right hand, and I put it all in my left hand, I still have snow in my left hand. But if I take an apple in each hand and transfer them to one hand, I do not have an apple in that

hand; I have two apples.

iv) Distributive reference: Dividing a denotation of a mass term into two parts yields two new denotations of that term. It is not so with count nouns. If I have snow in my right hand, and put half of it into my left hand, I still have snow in each hand. But if I take an apple in one hand, divide it in two and take one part of it in each hand, I have not an apple but a half an apple in each hand.

The parallel between the count/mass distinction for nouns and noun phrases and the aspectual delimited/non-delimited distinction for verbs and verb phrases has been noted by several authors, among them, Taylor (1977), Mourelatos (1981) and Hinrichs (1985). Taylor's treatment of this parallel, which makes use of the property of distributive reference, will be summarized here.

In addressing Aristotle's trichotomy of state verbs (statives), energeia verbs (activities) and kinesis verbs (accomplishments and achievements), Taylor equates the energeia verbs with 'stuffs' like gold, and the kinesis verbs with 'substances' like tables. (Taylor (1977) pp. 210-211):

...in general no (three-dimensional or other) space within a table is occupied by a table, whereas every three-dimensional area within a homogenous lump of gold is occupied by a lump of gold. For a form of words to encapsulate the difference, we may say that a homogenous stuff fills, whereas a substance delimits, the space it occupies.

Now, taking `falls' and `stabs' as paradigms respectively of E- (energeia) and K- (kinesis) verbs, the views of the last section can be summed up as the theses that falling fills time as a homogenous stuff fills space, whereas stabbing delimits time as a substance delimits space.

... just as in general no spatial area within a table is itself an area occupied by a table, so the last section holds that no period within a period of stabbing is itself such a period; and just as every three-dimensional spatial area within a lump of homogenous gold is itself such a lump of gold, so every period within a period of falling is itself a period of falling.

Taylor goes on to further divide `homogenous stuff' into homogenous and heterogenous stuff. The heterogenous stuffs contrast with the homogenous stuffs in having a lower limit to the applicability of the principle of distributive reference. Thus a fruitcake is a heterogenous stuff, because division of a fruitcake produces more fruitcake, but continued division will in the end produce a lump of walnut or cherry, instead of fruitcake. The temporal analogues of stuff -- the energeia verbs -- are refined by Taylor to include this bifurcation. Thus an arbitrarily small event of falling is still an event of falling, but an arbitrarily small event of walking -- say, lifting the heel off the ground -- is not an event of walking. A final refinement equates the kinesis verbs with heterogenous stuffs.<sup>15</sup>

The parallel between count/mass and delimited/non-delimited-ness is manifested most clearly by affectedness verbs, which translate one into the other.

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15. For further discussion see Taylor (1977).

### 3.3.3 Some semantic approaches to the compositionality of delimitedness

The translation of count/mass into delimited/non-delimitedness has attracted attention in the formal semantics literature. Some of the pieces of the picture assembled here have direct or indirect counterparts in the systems employed by semanticists who have considered this phenomenon. I will discuss in general terms the basic approaches of Verkuyl, Hinrichs, and Dowty to this phenomenon, and assess them in light of the discussion in sections 3.1 and 3.2. I will not go into detail about their systems. For more rigorous and detailed exposition of these ideas see Verkuyl (1985, 1987), Hinrichs (1985) and Dowty (1979).

#### (i) Verkuyl

In his work on aspect, Verkuyl has taken certain insights into aspectual phenomena and formalized them in a variety of systems.<sup>16</sup> I will not comment here on Verkuyl's formalizations of his ideas, but will confine myself to examining the ideas themselves, as they are put forth in his most recent works. (Verkuyl (1985) and (1987)).

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16. Verkuyl (1972) appeals to phrase structure rule systems; Verkuyl (1978) to ideas from generative semantics; Verkuyl (1987a) and (1987b) to set-theoretic semantic systems.

Verkuyl identifies those verbs that can translate spatial delimitedness into temporal delimitedness as having a feature [+ADD TO]. These are verbs expressing 'progress in time' or 'change'. The feature [+ADD TO] is associated with a 'successor function' that, loosely speaking, adds intervals of time (in a model) to the intervals over which the sentence is already true. Thus if a verb has the feature [+ADD TO] and the sentence containing the verb is true of an interval from time (a) to time (b), then the sentence is also true over the interval from time (a) to time (c) when (c) is a point of time after (b). Spatial delimitedness of the object is represented in Verkuyl's system as the feature [+SQA] (specified quantity of A). The presence of the feature [+SQA] results in the the successor function's output being abridged. That is, when the NP has the feature [+SQA] the successor function generates a finite rather than an infinite number of successive time intervals. The combination of a verb having the [+ADD TO] feature with a noun phrase having the [+SQA] feature results in the sentence containing the VP being true over a finite interval of time. In this way spatial delimitedness is translated into temporal delimitedness in Verkuyl's system.

Verkuyl has correctly identified the relevant characteristics of verbs for this phenomenon, as being something like change or progress in time. He has also observed, correctly, that the semantic/aspectual interaction between a verb and its direct argument is a special one. His

successor function, based on adding equal intervals to a time line, has the important features of a scale, on which the event is, in a sense, 'measured out'. However, since Verkuyl does not take note of the importance of the property of the argument by which the event is 'measured out', his approach is limited to verbs that 'measure out' the event through the spatial delimitedness of the object (or the Specified Quantity of A). A verb such as 'ripen' which depends on the property of ripeness instead of on spatial delimitedness for measuring out the event, will not be subsumed in his system. Lacking a reference to such a property the [+ADD TO] feature of affectedness verbs is simply a diacritic, and does not explain how these verbs characterize events as progressing in time through the change in their internal arguments.

(ii) Hinrichs (1985)

Hinrichs (1985) provides a formal semantic approach to Aktionsarten in English, drawing on work by Carlson (1977) and cast in Montague Grammar. I will address only his treatment of verbs which translate the count/mass distinction of their direct objects into a delimited/non-delimited distinction in the verb phrase. I will sketch out the major points of this treatment.

The delimitedness of accomplishments and the non-delimitedness of activities is treated by Hinrichs as deriving from a 'heterogenous reference property' and a

`homogenous reference property' associated with accomplishments and activities respectively. The `homogenous reference property' of an activity predicate is parallel to the cumulative reference property of mass nouns. It ensures that the temporal sum of two events of that activity is also an event of the same kind; if there is an event of John's sleeping from 5:00 to 6:00 and an event of John's sleeping from 6:00 to 7:00, then there is an event of John's sleeping from 5:00 to 7:00. The heterogenous reference property of accomplishment predicates parallels the lack of distributive reference for count terms. If there is an event of a pill's dissolving from 10:30 to 11:00, then there is no event of the pill's dissolving that occupies a temporal interval properly included within the interval 10:30 to 11:00. (e.g. There is no event of a pill's dissolving from 10:45 to 10:50.) These requirements of heterogenous and homogenous reference are laid out in meaning postulates, which must be satisfied by predicates of the appropriate type.

Hinrichs employs Carlson's idea of `stages' realizing an individual at a particular time and place, and extends this to the idea of `event stages', realizing an event at a particular spatio-temporal location. Meaning postulates address (among other things) the relationship between event stages realizing an event of, for instance, `building a house' and individual stages realizing the individual participants in the house-building at particular spatio-temporal location.

Accomplishment sentences like,

66

John built a house.

John ate a cake.

are accomplishments in Hinrich's system because the meaning postulates associated with 'build' and 'eat' result in the imposition of a uniqueness condition on stages of the direct object 'house' or 'cake'. There may be no stage realizing 'house' or 'cake' which is associated with any substage (temporal subpart) of the event stage realizing 'building a house' or 'eating a cake'. Such a substage would actually be an event of building part of a house, which is not the same kind of event as 'building a house'. For Hinrichs (following Carlson) mass terms and bare plurals are linked with 'kinds' as opposed to objects, and this allows them to escape the uniqueness condition. If John eats cake for an hour, there will be a smaller interval contained within that hour in which John also eats cake.

In brief, Hinrich's approach relies on the homogenous or heterogenous reference properties of count or mass terms, together with meaning postulates associated with individual predicates, to capture how affectedness verbs translate the count/mass distinction of their direct objects into the delimited/non-delimited distinction of the verb phrase. The idea of the argument 'measuring out' the event is incipient in Hinrich's system, although he does not make it explicit. The

association of stages of objects with substages of events approaches this idea. However, like Verkuyl, Hinrichs does not focus on the property by which the direct object measures out the event. His approach handles 'effected objects' (the objects of verbs of creation and consumption) smoothly, but by his own admission, it falls short in the treatment of what he calls 'affected objects' (the objects of verbs expressing a change of state), for which the relevant property is something other than spatial extent. It is necessary to refer to this property in order to integrate these two classes of verbs. For this reason Hinrichs fails to unify these verbs within a general aspectual theory of affectedness.

(iii) Dowty (1979)

Dowty (1979) provides a model-theoretic treatment of why a 'BECOME'-type verb with a plural indefinite (bare plural) or mass noun argument is aspectually durative, or non-delimited. ('BECOME' type verbs in Dowty's classification are delimiting verbs. See appendix to Chapter 1.) His treatment gives an account of why such a sentence can co-occur with a 'for' durative adverbial. The BECOME operator contained in the verb, when it is applied to the proposition p, makes the sentence express a change of state:

67

BECOME p is true at t iff p is true at t and false at t-1.

The sentence,

68

John discovered the buried treasure in his back yard for six weeks.

contains a BECOME-type verb and a countable argument and is ungrammatical according to Dowty. Dowty translates the durative adverbial 'for six weeks' as a quantified temporal expression with a two-place AT operator, i.e. 'for all times  $t$  such that  $t$  is a member of the period six weeks, it was true at  $t$  that  $p$ '. Sentence 68 is translated as:

69

$(\forall t: t \in \text{six weeks}) \text{AT}(t, \text{BECOME}[\text{John knows that...}])$

A contradiction is derived in applying this formula, because the time  $t$  at which the BECOME clause is true can be any arbitrary moment. If that moment is  $t_1$ , then  $t_1$  is the moment of change in the truth value of the proposition embedded under BECOME. But that moment could just as easily be chosen to be  $t_2$ , in which case  $t_2$  would mark the instant of change in the truth value. Clearly there can only be one time  $t$  at which the truth of the proposition changes from false to true. Sentence 68 is therefore ungrammatical because the interpretation would require that John discover the same thing in his back yard over and over again for six weeks.

However the same type of sentence can have that interpretation if the object of the verb is a plural indefinite or mass noun:

70

- a. John discovered fleas on his dog for six weeks.
- b. John discovered crabgrass in his yard for six weeks.

Sentence 70b may be paraphrased as in 71a but not 71b:

71

- a. For six weeks John discovered there to be some x such that x is crabgrass and is in his yard.
- b. \*There is some x such that x is crabgrass and for six weeks John discovered x to be in his yard.

Dowty (following Carlson(1977)) assumes that indefinite plurals and mass nouns have existential quantifiers within the scope of the temporal quantifier A logical representation for 71 would be:

72

$(\forall t: t \in \text{six weeks}) (\forall x) [AT(t, BECOME[\text{John knows that...}])]$

Since the value for x in this formula may change with the value for t, a contradiction is avoided. The embedded clause under the BECOME operator may become true at many different times t, because the object discovered need not be the same at each time t.

Dowty's treatment identifies a class of verbs -- those verbs specifying the BECOME operator in their lexical entries -- as describing delimited events when they have a definite direct object, and non-delimited events when they have bare plurals or mass nouns as direct objects. Insofar as Dowty's BECOME class of verbs identifies the affectedness verbs, he has

identified a significant class. But as pointed out by Hinrichs (1985) some verb phrase having 'event' objects like 'play a sonata' are not included in Dowty's BECOME class.

Dowty comes closer than Verkuyl or Hinrichs to recognizing the importance of the property of the object 'measuring out' the event. The proposition *p* embedded under the BECOME operator approximates the idea of a property changing over time (if *p* maintains that some particular state obtains of the object). However, Dowty does not characterize the event described by a BECOME verb as being capable of being measured out on a scale. In other words, *p* is only true or false; there are no degrees of 'p-ness'. Without degrees of 'p-ness' the function of the adverbials and comparatives discussed in section 3.3.2 cannot be captured.

There is a further problem with the analyses of Verkuyl, Hinrichs and Dowty. They do not distinguish between bare plurals and mass terms. While it is true that these may be grouped together semantically with respect to direct (or internal) arguments and delimitedness, they diverge in their semantic behavior with respect to external arguments and delimitedness. (This will be discussed in Chapter 4.) Furthermore, bare plural direct arguments need not always create a non-delimited verb phrase event. The sentence 'John opened doors' may represent an event in which all the doors John opened, he opened at once by pushing a button. Such an

event is delimited even though it involves an indefinite number of doors. There is an important difference between the non-delimitedness that results from the mass-ness of direct arguments and that which results from bare plural direct arguments, which must be captured in a viable theory of the compositionality of delimitedness.

These three authors who have addressed the compositionality of delimitedness from a formal semantic viewpoint have each proposed some elements of the aspectual function put forth in section 3.2. The idea of an event as measurable over cumulative intervals of time (as on a time scale), has been capitalized on by Verkuyl and Hinrichs.<sup>17</sup> This idea is incipient in the recognition that the properties of cumulative and distributive reference apply to the delimited/non-delimited distinction. The contribution of the direct argument to 'measuring out' the event is suggested by Hinrichs' association of stages of objects with subparts of events. The importance of the delimiting change in the object that takes place during the event is recognized by Dowty.

The contributions of the formal semantics literature to this problem, while important, are limited because they have addressed the phenomenon without making reference to the

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17. The idea that sentences are true at intervals rather than at points of time is also relevant here. Bennett and Partee (1978) present this view.

syntactically interesting class of affectedness verbs, or taking note of the fact that the aspectual property of delimitedness has syntactic ramifications. On the basis of syntactic behavior, an important class of verbs is identified, which unifies verbs with `affected', `effected' and `event' arguments, and whose direct arguments may be objects or subjects (in the case of unaccusatives). The syntactic evidence draws attention to the semantic properties these verbs share. The definition of this verb class in formal semantic terms should be tailored specifically to single out the syntactically interesting class of affectedness verbs. Verb classes which have both syntactic and semantic reality are grammatically significant because they provide insight into the interface of the two systems. Furthermore, when the class of affectedness verbs is defined as a semantic as well as a syntactic class, it leads to a statement that the direct argument `measures out' the event through the change over time in a particular property -- a view which turns out to encompass more than just affectedness verbs. This chapter and later chapters present several reasons for adopting this idea. This idea is implicit in some of the work of these authors, but nowhere, to the best of my knowledge, is it explicitly stated. I believe it is an idea that could be translated into formal semantic language, and which would contribute to formal semantic theory (e.g. by providing a means of constraining meaning postulates associated with

particular verbs.)

In conclusion, some of the ideas developed in this chapter are mirrored in the work of Verkuyl, Hinrichs and Dowty. The contribution of these authors is limited by their failure to connect semantic theory with syntactic theory. Some of the tools developed by these authors could be used with efficacy to address semantic phenomena as defined through syntactic means.

### 3.4 Total affectedness

The delimited interpretation of verb phrases or sentences containing affectedness verbs depends on an interpretation in which the object is totally affected; i.e., entirely consumed or created (or changed). This is the salient interpretation for these expressions in English. However, some speakers find these expressions ambiguous between a delimited and non-delimited reading. For these speakers the expression 'eat an apple' can be paraphrased as 'eat an apple up' (delimited and totally affected) or 'eat at an apple' (non-delimited and not totally affected). 'Read a book' can mean either 'read a book through' or 'read in a book'. Other examples of this kind of ambiguity are listed below. The b) and c) expressions are delimited and non-delimited paraphrases, respectively, of the ambiguous a) expressions:<sup>1</sup>

73

- |                                        |                 |
|----------------------------------------|-----------------|
| a. climb the mountain                  | (ambiguous)     |
| b. climb (all the way up) the mountain | (delimited)     |
| c. climb (around on) the mountain      | (non-delimited) |
|                                        |                 |
| a. perform the play                    | (ambiguous)     |

-----

1. What verbs will allow this ambiguity seems to be dependent on a highly individual property of the particular verbs. Verbs that allow this ambiguity seem to be verbs in which the spatial extent of the direct argument measures out the event. In the author's judgement some verbs that do not allow this ambiguity, but only take the totally affected interpretation are: record, cross, traverse, swim, run, walk, circumnavigate, transpose, transfer, disperse, corral, break, explode, persuade, confirm, bribe.

- b. perform the play (from beginning to end) (delimited)
- c. perform (some of) the play (non-delimited)
  
- a. paint the wall (ambiguous)
- b. paint (all of) the wall (delimited)
- c. paint (some of) the wall (non-delimited)
  
- a. translate the treatise (ambiguous)
- b. translate (all of) the treatise (delimited)
- c. translate (some of) the treatise (non-delimited)
  
- a. cut the cake (ambiguous)
- b. cut the cake through (delimited)
- c. cut the cake a little bit (non-delimited)  
(make a cut in the cake)
  
- a. rip the flag (ambiguous)
- b. rip the flag through (delimited)
- c. rip the flag a little bit (non-delimited)  
(make a rip in the flag)

For many speakers, spray/load verbs make the distinction between totally affected and non-totally affected readings especially clear. In the examples below, repeated from section 2.5.3, the event may be understood as delimited through a totally affected interpretation of the direct argument, but not of the indirect argument. The salient reading is that in which the direct argument is totally affected and indirect arguments are not necessarily totally affected.<sup>2</sup>

74

- a. Jeremiah sprayed the paint on the wall.
- b. Jeremiah sprayed the wall with paint.

-----

2. It is true that if one runs out of paint, while spraying the wall with paint, or runs out of wall while spraying paint on the wall (which is unlikely), the spraying-event must come to an end, but this is not a fact about the linguistic representation of the event; it is a fact about the world.

- a. Josiah cleared the dishes from the table.
- b. Josiah cleared the table of dishes.

Under the view advanced in section 3.2, in which affectedness verbs characterize events as measured out by some property of the verb's direct argument, the phenomenon of total affectedness receives a natural explanation. Total affectedness and affectedness (as it is defined here) are one and the same thing. If a verb describes an event which 'travels through' the spatial extent of its argument, the event is delimited by the argument's spatial extent; and all subparts of the argument have participated in the event. A delimited, or totally affected, interpretation results from using the entire scale defined by means of the object's spatial extension.<sup>3</sup> (It is unclear what 'total affectedness'

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3. This suggests a possible means of representing the difference between the totally affected and the non-totally affected interpretations in 74. If the totally affected interpretation results from using the entire scale, and the non-totally affected interpretation from using only some indefinite part of the scale, the distinction is easily represented as either universal or existential quantification over the scale dependent on the object's spatial extent. If this scale is represented by  $X_n$  (where the scale is graduated into units:  $X_1, X_2 \dots X_n$ ), the two interpretations may be represented as follows:

$A(X_n)$	totally affected, delimited
$E(X_n)$	not totally affected, non-delimited

Delimitedness and total affectedness is morphologically marked in many languages. This view suggests a line of research investigating whether some or all of these delimitedness

means with respect to verbs whose direct arguments measure out the event by some other means than spatial extension (e.g. 'ripeness').

The phenomenon of total affectedness in Hungarian provides interesting indirect evidence for the idea that semantic composition of a verb and its direct argument involves forming a scale out of some property of the direct argument. Hungarian is a language in which total affectedness is morphologically marked by a system of optional preverbs or perfective markers. The sentences below are Hungarian equivalents of English spray-load verbs. There are no aspectual preverbs, and the sentences do not have the sense that the direct arguments are totally affected. In 75a, the fat is the direct argument, and in 75b the bread is the direct argument of the verb. Not all the fat is necessarily smeared in 75a, or all the bread smeared in 75b.

75 (De Groot (1984))

- a. János zsírt ken a kenyérré  
John fat smears the bread-onto  
"John smears fat on the bread"
- b. János zsírral keni a kenyeret  
John fat-with smears the bread  
"John smears the bread with fat"

-----  
markers are quantifiers indicating total affectedness. The Hungarian aspectual preverbs (discussed in the following paragraphs), for instance, may be thought of as grammaticalizations of the universal quantifier A which is necessary for the interpretation of total affectedness, and which is not overtly marked in English. I leave this as an open question. That research will not be pursued here.

However, when the preverbs are applied, the direct arguments are understood as totally affected:

76

- a. János rá-keni a zsirt a kenyérre  
John onto-smears the fat the bread-onto  
"John smears fat on the bread"
- b. János zsírral meg-keni a kenyeret  
John fat-with perf-smears the bread  
"John smears the bread with fat"

Evidence for the object scale measuring out the event comes from an interesting difference in meaning between 75a and 75b. According to DeGroot (1984) (p. 144), 75a "means: John puts some fat on the bread, but does not necessarily smear the fat evenly over (a part of) the bread. 75b on the other hand, has the assumption that John indeed smears the fat evenly over (a part of) the bread." Even though total affectedness is not required of these direct objects because there are no aspectual preverbs, there is still something required of them because they are direct objects. Where 'bread' is the direct argument in 75b, all areas of the bread that are smeared with fat are equally smeared. That is, even though the direct argument 'bread' is not entirely affected it must be evenly affected.<sup>4</sup> The direct argument status of 'bread' forces it to

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4. This view predicts that, for those speakers of English who accept (a) below, there should be a difference in meaning between (a) and (b):

be interpreted as changing on a scale. Because a scale is divisible into parts of equal value, the change described by such a scale is divisible into equal changes. Therefore where the bread is the direct argument, its parts are equally affected. This is predicted by a theory in which a scale measuring out the event is constructed on a property of the object.

### 3.5 Delimitedness and case

Affectedness, a semantic constraint on the formation of middles and NP passives in English, is actually an aspectual constraint dependent on delimitedness. We must examine the question of what exactly is the connection between delimitedness and syntax. Since middles and NP passives are formed by NP movement, we must assume that the interesting correlation is between delimitedness and NP movement. However, the delimitedness constraint does not apply to all instances of NP movement; it does not apply to verbal passivization or raising, for example.<sup>5</sup> In the case of passivization and raising there is some syntactic element

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- a. John ate the bread (but didn't finish it.)
- b. John ate at the bread.

This is a question for further research.

5. In Chapter 6 the possibility will be raised of a delimitedness constraint on unaccusatives as well. This is an open question.

present -- the passive morphology or a modal verb -- which may account for the lack of any delimitedness constraint on these operations.

In the Government and Binding framework, the case assigning properties of the verb force NP movement. If a verb assigning accusative case to its direct argument loses its case assigning properties, that argument moves to the position of specifier of IP, where it is assigned case by INFL/AGR. The delimitedness constraint may be rephrased in terms of case theory in the following way:

77

#### Delimitedness-Case Constraint

INFL/AGR cannot assign case to the direct argument of a verb describing a non-delimited event, without the mediation of some special element appearing in the syntax.

Note that the Delimitedness-Case constraint requires that the syntax, specifically case theory, be able to refer to a semantic featural distinction of +/-delimitedness. The need for syntax to refer to features is not surprising. Lumsden (1987) argues for the importance of features in the syntax of natural languages. The Delimitedness-Case Constraint is proposed here as a tentative explanation of the link between aspect and case. It requires further research, and further

conceptual integration into a theory of grammar.<sup>6</sup>

There is evidence of a connection between aspect and case. Recall the discussion of Finnish in Chapter 2. In Finnish, accusative and partitive case-marking directly encode the delimitedness or non-delimitedness of the verb phrase. Additional evidence comes from Hindi, in which a semantic distinction between affected and unaffected agents is reflected in case assignment. Saksena (1980) discusses morphologically related causative/non-causative verb pairs in Hindi. The subject/agent of one member of the pair is the object/causee in the other member. The object causee position receives different case marking, depending on whether it is an affected or unaffected agent. (D/A = dative accusative case marker; DC = direct causative suffix.)

78

a. raam-nee nahaa-yaa  
Ram-AGT bathe-PAST  
'Ram bathed.'

b. māī-nee raam-koo/\*see nahal-aa-yaa.  
I-AGT Ram-D/A bathe-DC-PAST

-----

6. It has come to my attention that Rizzi (1986) argues that in Italian, objects of affectedness verbs may not be null objects with arbitrary interpretation. This is a phenomenon that would not be subsumed under the Delimitedness-Case Constraint. Also, the movement of nominal quantifiers in Japanese discussed in section 2.5.2 may be movement to topic position, in which case the Delimitedness-Case Constraint does not cover it. Finally, there appear to be certain delimitedness constraints on LF movement as well (Kelly Sloan (in prep)). These cases may not be subsumable under the Delimitedness-Case Constraint.

`I bathed Ram.'

79

a. raam-nee peeṛ kaat-aa.  
Ram-AGT tree cut-PAST  
'Ram cut the tree.'

b. māī-nee raam-see/\*koo peeṛ kaṭ-aa-yaa.  
I-AGT Ram tree cut-DC-PAST(m.)  
'I made Ram cut the tree.'

In the event described in 78 above Ram is an affected agent, since he undergoes a change of state from being unbathed to being bathed. In 79 'Ram' is an unaffected agent, since he undergoes no change of state in the event of cutting described by the verb 'peer'. In both of the a) sentences 'Ram' is marked with the agent case marker 'nee'. In the b) sentences, where Ram is the object causee, the case marking distinction emerges. 'Ram' is marked with the dative/accusative case marker 'koo' where Ram is an affected agent (78), and with the instrumental case marker 'see' where he is an unaffected agent (79).

The case markers 'koo' and 'see' are in complementary distribution. In the few cases where a verb may have its argument marked with either case marker, a semantic distinction accompanies the case marking difference. (IC = indirect causative suffix.)

80

māī-nee raam-see/koo kitaab parh-vaa-ii  
I-AGT Ram book read-IC-PAST(f.)  
'I had Ram read the book.'

If 'Ram' is marked with the dative/accusative casemarker

`koo', the sentence means that Ram himself was made to read the book. If `Ram' is marked with the instrumental case marker `see', it means that the book was made to be read, and Ram was an instrument to that end.

The affectedness constraint is stated in 77 above in terms of the interaction of aspectual delimitedness and case theory -- both of which must be included in the grammar for independent reasons. This is an improvement over stating it in terms of the interaction of a semantic property somewhat amorphously described as `affectedness', with individual constructions such as middles, NP passives, and so on. Stated in this way, the affectedness constraint will contribute to directing future research into the theory of case and aspect. Nevertheless it leaves a lot to be desired in explanatory power. In the opinion of this author, a deeper understanding of this phenomenon must await a deeper understanding of case.

## Chapter 4. Aspectual Principles of Argument Structure

### 4.1 Introduction

There are two facts discussed in the preceding chapters, which taken together, point to a connection between delimitedness and argument structure: the property of delimitedness is the basis of the property of affectedness; and affectedness is only associated with direct arguments. This suggests a connection between delimitedness and direct argument-hood. If we can understand this connection, then delimitedness will become a useful tool for investigating argument structure. This is the central undertaking of this chapter.

A deeper investigation into the relationship between delimitedness and internal, external and oblique arguments reveals some basic principles of argument structure: Events are linguistically described as delimited through the change in the direct argument. Direct arguments, in a sense, 'measure out' the event over time, in a way that can be precisely characterized. If a direct argument undergoes change during an event, that change can be characterized as change on a scale or change in a single parameter. This is not required of external arguments. Furthermore, it is the scale provided by the direct argument through which events are linguistically delimited. The endpoint of the event must be marked on that scale by the change within the direct argument

(as in the case of affectedness verbs) or by an oblique internal argument which indirectly contributes an endpoint on the scale provided by the direct argument. Delimitedness is encoded within the VP; the external argument is outside the domain in which delimitedness is determined. Finally, there may be only one 'delimiting' associated with a verb phrase. These principles of argument structure will turn out to have consequences for syntax, and for the mapping of cognitive structure into syntactic structure.

The discussion in this chapter will proceed as follows. Since affectedness verbs have been discussed in Chapter 3, I will concentrate on non-affectedness verbs in Chapter 4. I will discuss a range of verbs, and show that while change in a direct argument is characterizable as 'measuring out' the event on a scale (section 4.2), change in an external argument does not have to be so characterizable (section 4.3). Section 4.4 will demonstrate that oblique arguments which linguistically delimit an event, such as sources or goals, do so parasitically by means of the scale provided by the direct argument.

It is necessary to clarify how I am using certain terminology. The distinction between external, internal direct and internal oblique arguments I take to be an essentially syntactic distinction; the direct internal argument is governed by the verb at deep structure, the



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-- verbs with unaffected direct arguments or no direct arguments -- we find that the special semantic status of direct arguments extends to these verbs as well. The change undergone by the direct argument in the course of the event is characterizable as the scale which 'measures out' the event. It is that scale through which the event is delimited.

This section is organized as follows. First I will discuss non-affectedness verbs which describe events in which the direct argument undergoes change but does not delimit the event. Just as with affectedness verbs, some property of the direct argument of these verbs becomes a scale by which the event is 'measured out' (even though the direct argument itself does not delimit the event on that scale.) Next I will discuss non-affectedness verbs that have no direct arguments or have optional direct arguments, and show that the events they describe are delimited only when they have a direct argument. Then I will discuss non-affectedness verbs which describe events in which there is no change, motion or activity on the part of the direct argument, and show that they describe non-delimited events. I take these three groups of verbs to be representative of non-affectedness verbs generally. Finally, I will mention several cases of minimal pairs in which the same event participant is either a direct object or an indirect object. Where it is the direct object it 'measures out' and delimits the event. Where it is an oblique object it does not.

#### 4.2.1 Verbs of imparting motion

There is a group of verbs that describe events in which there is change, motion or activity (progress in time) in the internal argument during the course of the event, but that change does not result in a change of state, or a delimited event. These are not affectedness verbs, but their internal arguments do, in a sense, 'measure out' the event although they do not delimit it. The main examples of this class are verbs of imparting motion such as 'push', 'shove' or 'roll'.<sup>2</sup> They are usually not affectedness verbs, and when combined with a direct object they do not describe delimited events:

1  
James pushed the cart. (non-delimited)  
James drove the truck. (non-delimited)  
James rolled the log (down the hill). (non-delimited)

Verbs like these, in their salient readings, describe events in which the direct argument undergoes a change in location. Just as with the verbs of change of physical state described in section 3.1.2, a property of the object is singled out by the verb as the locus of change. That changing property of the internal argument, location, is measurable on a scale. This is what some rate adverbials refer to; they modify the

-----  
2. Recall from Chapter 3 that verbs of motion may be used occasionally as change of state verbs. This is not the usage discussed here. These verbs more commonly describe non-delimited events, which is how they are used above.

change in location (or distance traveled) of the internal argument over time:

2  
push the cart slowly  
drive the truck fast  
roll the log down the hill slowly

That scale is also invoked by the comparative '-er', which expresses the change in gradients or degrees:

3  
push the cart further  
drive the truck further  
don't roll the log quite as far down the hill

Finally (anticipating section 4.4), additional delimiting expressions like goal phrases may be added to the verb phrase. These expressions delimit the event described by marking a point on the scale determined by the changing location of the direct argument:

4  
push the cart to San Francisco (delimited)  
drive the truck to town (delimited)  
roll the log to the top of the hill (delimited)

These verbs exemplify a class of verbs in which some property of the direct argument is specified as changing over time in a scalar fashion, just as in the case of affectedness verbs. However, that change is non-delimiting, since the property that changes has no endpoint or final change of state. The direct arguments of these verbs do not delimit the event, but they provide the scale along which the events are

delimitable.<sup>3</sup> These verbs would have an aspectual function like the following:<sup>4</sup>

5

$A_{\text{verb}}(\text{direct argument}) = (\Delta^n \text{ distance moved}, \Delta t)$

6

$A_{\text{push}}(\text{the cart}) = (\Delta^n \text{ distance traveled by cart}, \Delta t)$

#### 4.2.2 Unergatives, reflexives and cognate objects

Intransitive unergative verbs, which have no internal arguments at all, describe non-delimited events:<sup>5</sup>

7

Mary ran (for an hour/\*in an hour).  
Mary danced (for an hour/\*in an hour).  
Mary sang (for an hour/\*in an hour).

Where they may be understood to describe delimited events,

-----

3. Recall from the discussion in section 3.1.2 that verbs like 'ripen', 'redden' and 'widen' may have non-delimited readings (which are not possible in middles or NP passives but are possible in a regular transitive usage of the verb). If these verbs in their non-delimited interpretations constitute a class of verbs describing non-delimited events, they belong with the verbs of imparting motion above, in which the direct argument 'measures out' the event but does not delimit it. The proper treatment of this type of verb (or verb interpretation) is left as an open question.

4. See section 3.2.

5. These verbs are acceptable with 'in an hour' if they are used inceptively: 'She will run/dance/sing in an hour.' In this case the verbs are used as change of state verbs. That is not the reading discussed here.

they are understood as if they had a reflexive object, or a cognate object. Expressions with reflexive verbs describe delimited events because the action described by the verb progresses through the reflexive object during the event. In the examples below, the reflexive object delimits the event and disambiguates the verb phrase:

- 8
- |                  |                            |
|------------------|----------------------------|
| a. bathe         | (non-delimited, delimited) |
| b. bathe oneself | (delimited)                |
|                  |                            |
| a. shave         | (non-delimited, delimited) |
| b. shave himself | (delimited)                |
|                  |                            |
| a. wash          | (non-delimited, delimited) |
| b. wash yourself | (delimited)                |

Cognate objects delimit the event described by a verb by making reference to one event of that type. The presence of a cognate object forces a delimited interpretation:<sup>6</sup>

- 9
- |                             |                            |
|-----------------------------|----------------------------|
| a. sneeze                   | (non-delimited, delimited) |
| b. sneeze a horrific sneeze | (delimited)                |
|                             |                            |
| a. laugh                    | (non-delimited, delimited) |
| b. laugh a mirthless laugh  | (delimited)                |
|                             |                            |
| a. dance                    | (non-delimited)            |
| b. dance a dance            | (delimited)                |

-----

6. Some speakers can get a non-delimited reading for the b) sentences in 8 and 9 as well. These are also relatively acceptable with durative adverbials. 'John shaved himself for an hour', 'Mary sang a song for an hour'. This interpretation results when the action does not progress through the object during the course of the event. In any case, the fact remains that where a delimited reading is possible it depends on an actual or an understood object 'measuring out' the event.

- a. sing (non-delimited)
- b. sing a joyful song (delimited)

Object deletion verbs which describe non-delimited events when they are without a direct object describe delimited events when they have a spatially delimited direct object:

- 10
- a. John smoked. (non-delimited, delimited)
  - b. John smoked a Canadian cigarette. (delimited)
  - a. Mary drank. (non-delimited, delimited)
  - b. Mary drank a jug of apple wine. (delimited)

These events are delimited through their direct arguments in the same way as events described by verbs of consumption and creation; the action taken by the external argument progresses through the spatial (or temporal) extent of the internal argument over time.

#### 4.2.3 Verbs describing events with no change in the internal argument

Chapter 3 and sections 4.2.1 and 4.2.2 have demonstrated that events are linguistically described as delimited through some change in the internal argument. What about verbs that describe events in which there is no change in the internal argument? These verbs describe non-delimited events or situations.<sup>7</sup>

-----

7. I have not extended the idea of a scale dependent on the direct argument, to verbs that describe situations or events

Verbs in this group may be divided into two classes, depending on whether or not there is change, motion or activity in the external argument during the course of the event described. Verbs that describe events in which there is change, motion or activity on the part of the external argument but not the internal argument include perception verbs ('watch', 'observe'), verbs of contact ('tap', 'hit', 'beat', 'wave', 'poke', 'kick'), and miscellaneous other verbs ('kiss', 'remember').

11

observe the magnetometer (for an hour/\*in an hour)

watch a moose (for an hour/\*in an hour)

remember a dream (for an hour/?in an hour)<sup>8</sup>

Verbs of contact in their salient readings describe non-delimited events:<sup>9</sup>

-----  
in which there is no change, motion or activity on the part of the internal argument. However, something like this may be appropriate, because the direct arguments of these verbs also seem to have a privileged semantic status. To test this idea it would be necessary to find some properties of a scale that can be manifested without progress in time. Something like this may account for the notion of "affected" discussed in section 2.5.4. I will not pursue this here.

8. 'Remember' occasionally has a delimited usage, as when one attempts to remember something and then suddenly succeeds. In this case the internal argument is 'measuring out' the event; 'remember a dream halfway' can mean 'remember half a dream'.

9. A delimited/non-delimited ambiguity in the case of verbs of contact is discussed in section 3.3.1.

12

wave your hand (for an hour/\*in an hour)  
beat the drum (for an hour/\*in an hour)  
tap the wall (for an hour/\*in an hour)

Finally, statives, which describe situations<sup>10</sup> in which neither the external nor the internal argument progresses over time, always describe non-delimited situations:<sup>11</sup>

13

Bill knows the way to San Jose.	{ non-delimited }
The two walls touch at the corner.	{ non-delimited }
This cheese stinks.	{ non-delimited }

-----

10. Although I am using the term 'event' in a non-technical sense, it seems inappropriate to refer to statives as describing events. I will refer to them instead as describing situations.

11. The fact that neither the external nor the internal argument progresses in time during the situation described by a stative verb, gives statives their distinctive characteristics. Stative verbs differ in a crucial respect from non-statives. A distinguishing feature of stative predicates is that they describe situations that do not require temporal duration in order to transpire, whereas non-statives describe events that require some stretch of time. An event of singing is a non-stative event that transpires over time; the singer must move her mouth and activate her vocal chords in a certain way, and a fragment of song must be produced. As we observe smaller and smaller intervals of such an event, the event eventually loses its identity as an event of singing. If the singer opens her mouth a fraction of a millimeter, and emits a squeak, that is not what would generally be considered singing. However, no matter how small a temporal interval we consider, of a situation described by a stative verb such as 'resemble', the situation is still describable by the verb. If John resembles his cousin for a minute, he resembles his cousin for a millisecond included in that minute. Statives describe events that are independent of temporal duration. (For further discussion and some complications, see Dowty (1979), Taylor (1977).) That is not to say that stative situations cannot have duration; John may resemble his cousin for a month or a year, and then have his hair dyed blue and lose all resemblance to his cousin.

My arm itches.

(non-delimited)

Sections 4.2.1 through 4.2.3 have shown that an internal argument of a non-affectedness verb may be characterized by the verb as undergoing a change ('push', 'drive', etc.), or it may not be characterized by the verb as undergoing any change at all ('watch', 'hit', 'know'). If there is change in the internal argument it must be characterizable as a change in a single parameter, or a change that is measurable on a scale. The event is then linguistically delimitable on that scale.

#### 4.2.4 Conative and antipassive alternations

Consideration of the semantic contributions of affected and unaffected direct arguments reveals that the semantic contributions of direct arguments are subject to certain general constraints; direct arguments either undergo no change during the event, or they undergo change that can 'measure out' the event. Only direct arguments may be totally affected, because total affectedness depends on the direct argument 'measuring out' the event with the entirety of the scale it provides. Examples of minimal pairs can be found in some languages, in which the same event participant is represented as the direct and oblique argument of the verb. In these cases, only the sentences with direct arguments have totally affected or delimited readings. Recall the discussion of spray/load verbs in Chapter 2; the totally affected reading is available (and for many speakers, salient) for whichever

event participant is the direct argument but not available for the one that is the indirect argument. The English conative alternation is another good example:<sup>12</sup>

14

- a. eat the apple
- b. eat at the apple

The totally affected interpretation is available for 14a, in which 'apple' is the verb's direct argument, because it measures out the event. In 14b, where 'apple' is an indirect argument, it does not measure out the event and the totally affected reading is unavailable.

Antipassive alternations provide minimal pairs in which the argument may be direct or oblique (indirect). Bittner (1987) has noted some interesting data from West Greenlandic Eskimo. West Greenlandic Eskimo has three antipassive suffixes which have certain aspectual properties. When one of these antipassive suffixes is applied to a transitive verb (as in 15), the argument marked with accusative case becomes marked

-----

12. The observant reader will have noticed that the conative alternation is possible with verbs of contact:

- hit the fence
- hit at the fence

The difference in meaning obtains even though 'hit' usually has an unaffected direct argument. This probably reflects the ambiguity many verbs of contact have regarding whether they describe delimited or non-delimited events (section 3.3.1.). I leave this issue open.

with instrumental case, and the transitive verb becomes intransitive (as in 16). (West Greenlandic Eskimo has absolutive/ergative case marking; i.e., the subjects of transitive verbs are marked with ergative case and the subjects of intransitive verbs are marked with absolutive case.)

15

Jaaku-p ujarak tigu-a-a  
 Jacob-ERG stone-ABS take-transitive.indicator-3sgE/3sgA  
 "Jacob took stone."

16

Jaaku ujarak-mik  
 Jacob-ABS stone-INSTR

tigu-si-vu-q  
 take-antipassive-intransitive.indicator-3sgA

"Jacob took stone."

Intransitive antipassive sentences like 16 above are imperfective. Bittner writes:

For example, with an accomplishment verb like "kill", the transitive form entails that the object referent is dead, whereas the -si, -(ss)i, and -nnig antipassives are compatible with the victim being almost but not quite dead yet. Similarly, for the verb iqgut- "bring inside", the transitive form entails that the agent has come in with the object; while for the -(ss)i antipassive two of my informants envisaged a situation with a double door to the house (e.g., for better insulation), and that the agent has come in through the outer door but not yet through the inner one.

In 16 the transitive verb form is associated with a delimited, totally affected interpretation. The antipassive forms are associated with non-delimited, incomplete events.

Warlpiri exhibits a conative alternation. (Example 17 is from Guerssel, Hale, Laughren, Levin, WhiteEagle (1985).)

17

- a. Marlu        luwarnu Jakamarra-rlu.  
kangaroo shot    Jakamarra-ERG  
"Jakamarra shot the kangaroo."
- b. marlu-ku-rla-jinta        luwarnu Jakamarra-rlu.  
kangaroo-DAT-3sO-PURP shot    Jakamarra-ERG  
"Jakamarra shot at the kangaroo."

When the `kangaroo' is the direct argument of the verb (as in 17a above) it is an affected argument. When (as in 17b) it is an indirect argument marked with dative case, it is unaffected.

In these examples from English, West Greenlandic Eskimo and Warlpiri an argument is affected (or totally affected) when it is a direct argument, and unaffected when it is an indirect argument. This is consonant with a theory in which only direct arguments `measure out' the event.

Direct or internal arguments represent event participants that do not undergo change, or else undergo change that `measures out' the event described by the verb. They are accordingly associated with thematic roles that meet these semantic/aspectual requirements. Some characterizations of thematic structure in the literature focus on the idea of change over time. Gruber's idea of a theme as "the entity which is conceived as moving or undergoing transitions" is an example (Gruber (1965) p.38). Jackendoff's (1987) "path"

constituent of conceptual structures is another.<sup>13</sup> These authors have noted the importance of the idea of 'change' in linguistically described events, but they have not explained it in aspectual terms, or explained the special relationship between the direct argument and 'change'. I will return to a discussion of thematic structure in Chapter 6.

### 4.3 External arguments

#### 4.3.1 External arguments and thematic roles

In comparison with internal arguments, a wide range of thematic roles may appear in the external argument position. This is indicative of the familiar fact that the thematic constraints on external arguments are much looser. The variety of thematic roles that can be associated with external arguments is illustrated below:

18

AGENT:

Chester dug a hole.

NATURAL FORCE:

The sun dried the clothes. (Levin p.c.)

INSTRUMENT:

The hammer broke the window. (Levin 1986)

(David broke the window with a hammer.)

-----

13. Gruber's definition of 'theme' is not based entirely on aspectual properties, so his 'theme' is not limited to direct argument positions. It may be associated with external arguments. Jackendoff's path complement, however, to the best of my understanding, does not turn up in external argument position.

**EXPERIENCER:**  
Bill fears wasps.

**SOURCE:**  
Katherine sold a cord of wood.

**GOAL:**  
John bought a tractor.  
John received a package in the mail.

**LOCATION:** (Levin 1986; her source, Perlmutter and Postal (1984))  
This room sleeps five people.  
(We sleep five people in each room.)

**TEMPORAL LOCATION:**(Levin 1986; her source, Perlmutter and Postal  
1492 saw the beginning of a new era. (Levin 1986) (1984)  
(A new era began in 1492.)

**MATERIAL:**  
Water splashed the wall.  
(Laura splashed the wall with water.)

**RAW MATERIAL:** (Levin p.c.)  
This flour bakes good cakes.

**NON-DELIMITING PATH:**  
The shore channels the current into the bay.  
(The engineers channeled the current along the shore into the bay.)

**OTHER:**  
The box weighs five pounds.  
The circle surrounds the dot.

I continue in the approach that a verb describes an event by describing the changes that take place in its internal and external arguments during the event. As we have seen in the previous section, the verb describes very precisely what changes take place in the internal argument, but it is less specific about what happens in the external argument during the course of the event. If there is change, motion or activity on the part of the external argument, this change, motion or activity is not necessarily completely specified by

the verb, or characterizable as a change in a single property that 'measures out' the event. To see that the external argument need not provide a scale for the event described by the verb we need only to consider the most common thematic role to be found in external argument position -- that of agent.

19

- a. Robin picked tomatoes.
- b. Frank cut wood.

Examples 19a and 19b above describe events in which the activity carried out by the external argument is not completely specified. Robin may have picked tomatoes by hand, or with shears; Frank may have cut wood with a saw, an axe or even a penknife. The sentence does not require that in the event it describes the agent external argument uses any particular method or tool. The change in the internal argument -- the tomatoes or the wood -- does not allow such freedom of interpretation. The difference between cut wood and uncut wood is more explicit than the difference between someone who is engaged in the activity of cutting and someone not engaged in cutting.

Even when the instrument used by the external argument is specified in the verb, as in:

20

Laura mopped the floor.

the change, motion, or activity engaged in by the external argument may vary in many ways and still be described by the same sentence. Laura may drop the mop in a bucket of water and then apply it to the floor, or she may dump the water onto the floor and then slish the mop around in it. What is of crucial importance here is the agent's manner of participation in an event. The agent thematic role represents an event participant that does undergo change, motion or activity. But this activity is not completely specifiable. Mopping, picking tomatoes or cutting wood involve a variety of sub-actions, such as lifting, pushing or wringing the mop; grasping tomatoes and pulling them off the stems; holding, guiding and positioning the saw. One may infer from these sentences that some or all of these sub-activities took place in the events they describe, but it is not necessary that they took place for the sentences to be true.

More importantly, even if the action performed by the agent were completely and explicitly specified by the verb, it would not be undifferentiated with respect to the event. By this I mean that the action would not be characterizable as a change in a single parameter, unlike the change in a direct argument which can be characterized by a change in some salient property of the argument. It is easy to see that in an event of Laura's mopping the floor, as the event progresses in time all that happens to the floor is that it changes from an unmopped to a mopped state, while Laura undergoes change and

motion by moving around with a mop and sloshing it in and out of a bucket. The internal argument, the floor, undergoes change characterizable on a single parameter and specified by the verb. The external argument, Laura, does not.

The agent thematic role represents a type of event participant that is inherently unsuited to characterization by a scalar change. The agent thematic role is always assigned to the external argument position for this reason. The external argument, unlike the direct argument, is not required to provide a scale for the event described by the verb, and so it is compatible with thematic roles that describe event participants that could not supply such a scale.

The relative freedom allowed in the interpretation of the way the external argument participates in an event makes it possible for the external argument to seem to be part of a separate event. A number of authors have suggested<sup>14</sup> something along these lines; the external argument engages in one action or event, which causes another event to take place in the internal argument. This intuition reflects the differing semantic constraints on internal and external arguments. Internal arguments in concert with a verb describe an event in a narrow and precise way. (Hale and Keyser (1987)

-----

14. Hale and Keyser (1987) adopt this view. It is also implicit in Dowty's (1979) bisentential analysis of CAUSE.

describe the participation of the internal argument as the "central event" which a sentence describes.) External arguments, associated loosely with the 'central event', may be construed as engaging in activity separate enough from the 'central event' to seem to be an event unto itself.<sup>15</sup>

The tests that were applied to direct arguments to show that they provide a scale for the event described by the verb work differently with agent external arguments. Rate adverbials may apply to the external argument (or rather to the activity engaged in by the external argument), but when they do so they modify, not a scale provided by the argument and mapped onto time, but an unspecified collection of changes or activities associated with the external argument and mapped onto time. Consequently, it is not clear which of the actions or whether all of the actions engaged in by the external argument are being modified. Does the sentence 'Robin picked tomatoes slowly' only refer to an event in which every movement of Robin's involved in tomato-picking was a slow movement? Robin may have reached for the tomatoes slowly, pulled them off the vine slowly, and then tossed them quickly into a bucket. That would be an event describable by the sentence, even though not every component of Robin's motion was slow. However, if 'slowly' is taken to apply to the direct argument, tomatoes,

-----

15. The reader is reminded that the term 'event' is used loosely and intuitively here.

it is clear what it means about the event described by the verb; the rate at which tomatoes left the vine and went into the tomato bucket was slow.

The contrast between rate adverbials modifying the external and the internal argument is made clearer by the following sentences. The verbs in the a) sentences below are unergatives, meaning their arguments are external. The verbs in the b) sentences are unaccusatives and their arguments are internal.<sup>16</sup> The adverbial expressions 'a little bit at a time' and 'a lot at once' make explicit reference to measuring out something on a scale, over time. Therefore they are anomalous with the external arguments of unergative verbs, but acceptable with the internal arguments of unaccusative verbs:

21

- a. The dancer danced slowly /\* a little bit at a time.  
The announcer talked slowly /\* a little bit at a time.
- b. The candle melted slowly /a little bit at a time.  
The lake froze slowly /a little bit at a time.

22

- a. ?Martha danced quickly, a lot of her dancing at once.  
?The announcer talked quickly, a lot of him talking at once.
- b. The candle melted quickly, a lot of it melting at once.  
The lake froze quickly, a lot of it freezing at once.

Since there is only one argument in each of the sentences

-----

16. The theory of unaccusative and unergative verbs will be addressed in Chapter 6. For now we accept these sentences as minimal pair examples of verbs with either a single external or a single internal argument.

above, there is no ambiguity as to which argument's change or motion is being modified by the rate adverbial. In the a) sentences, where the adverbial phrase modifies an external argument, it is not modifying a scale. In the b) sentences, where it is modifying an internal argument, it does modify a scale.

Certain adverbials yield an explicit value on a scale for the event described by the verb, and so they can be used as tests for the presence of a scale. The adverbial 'halfway' is an example. It is anomalous with agent external arguments:

23

\*Martha danced halfway.

\*Thomas ate halfway.

and acceptable with internal arguments:

24

The lake froze halfway.

The candle melted halfway.

When it occurs in a sentence with both internal and external arguments, it modifies the change in the internal argument.

The sentence,

25

Jacinta ate an apple halfway.

may be paraphrased as:

26

Jacinta ate half an apple.

but not as:

27

a. Half of Jacinta ate an apple.

b. Jacinta half ate and half gulped an apple.

27a would be a paraphrase of a sentence in which the scale was constructed directly out of the external argument, Jacinta; and 27b would be a paraphrase of a sentence in which 'half' was applied to the unspecified collection of actions that constitute Jacinta's actions of eating. Neither is a possible paraphrase, so the adverb 'halfway' (which explicitly means covering half the distance on some sort of a scale) applies only to the change or motion of the internal argument.<sup>17</sup>

The adverbial expressions that are odd with agent external arguments are odd with other thematic roles occupying external argument position as well. (These tests only apply to non-statives.)

-----

17. Some unergative verbs of motion are acceptable with the adverbial 'halfway': 'Aaron walked halfway'. But in these sentences 'halfway' modifies a change in location, not the collection of actions involved in the activity of walking. The sentence is not paraphrased by either of the following: 'Half of Aaron walked', or 'Aaron half walked and half ran'. What the sentence means is 'Aaron walked half of some distance'. Again, the scale that 'halfway' depends upon for its interpretation can only be directly expressed through an internal argument; 'walk halfway' must be understood as 'walk half the distance'.

28

- a. \*The sun dried the clothes quickly, a lot of it (the sun) drying the clothes at once.
- b. The sun dried the clothes halfway.  
possible paraphrases:  
\*Half the sun dried the clothes.  
Half the clothes dried.

29

- a. \*The hammer broke the window quickly, a lot of it (the hammer) breaking the window at once.
- b. The hammer broke the window halfway.  
possible paraphrases:  
\*Half the hammer broke the window.  
Half the window broke.

30

- a. \*The shore channeled the current quickly, a lot of it (the shore) channeling the current at once.
- b. The shore channeled the current halfway.  
possible paraphrases:  
\*Half the shore channeled the current.  
The shore channeled the current half of some distance (to be traveled by the current).

31

- b. ?This flour baked a good cake halfway.<sup>18</sup>  
possible inferences:  
\*Half the flour is consumed.  
The cake is half-baked.  
Half the cake is baked.

32

- b. ?Water splashed the wall halfway.

32 is ambiguous between a reading in which the direct argument is affected and measures out the event, and one in which it is unaffected. The adverbial 'halfway' only makes sense in the

-----

18. In the judgement of this author 'quickly' and 'slowly' are odd when used with the verbs 'bake' and 'splash', in a sentence without an agent. The adverbial tests are omitted for this reason in 31 and 32.

former reading, in which case the sentence means water splashed half the wall, not half the water splashed the wall. This is clearer in the following example:

33

?A bucket of water splashed the wall halfway.

possible inferences:

\*Half a bucket of water splashed the wall.

A bucket of water splashed half the wall.

These tests are more difficult to apply in the case of verbs taking a source or a goal as external argument:

34

John bought a tractor quickly.

Mary sold a cord of wood quickly.

These verbs express events with little or no duration, so it is difficult to construe 'quickly', 'slowly' or 'halfway' as modifying the change in the direct argument during the course of the event. It is possible to understand 'quickly' as modifying the time it took for the buying or selling event to take place. If it modifies the participants of the external argument, then it modifies the unspecified collection of actions that are involved in John's buying or Mary's selling, which cannot be represented as a scalar change. If it modifies the participation of the internal argument, it modifies the wood's or the tractor's having changed hands. The direct arguments undergo only a simple change of ownership -- a change of state. The external arguments, being sources or goals, represent event participants that undergo a change

at the point in time marking the end of the event -- but that terminus is already registered in the internal argument's change of state. The external argument's marking of the event terminus is redundant. The verb phrases:

35  
buy a tractor  
sell a cord of wood

represent delimited events independently of the external argument. Moreover, it is only the change in the internal argument that can be characterized as a change in a single parameter.

Examples 27 to 35 show that even though external arguments with thematic roles other than agents are not quite as clearcut in their interaction with the adverbial tests above, they nevertheless support the generalization that internal arguments can 'measure out' and delimit a linguistically described event, but external arguments cannot. It is through the direct argument that the event is defined temporally. The direct argument is identified with the event in a very particular way.

Although a variety of thematic roles may occupy the external argument position, some alternations involving verbs that can alternate external with internal or oblique arguments are impossible when the external argument would clearly delimit the event independently of any internal argument:

36

- a. Five people slept in this room.
- b. This room slept five people.
- c. Five people slept to New York (during a train ride from Boston to New York.)<sup>19</sup>
- d. \*New York slept five people.

37

- a. The engineers channeled the current along the shore into the bay.
- b. The shore channels the current into the bay.
- c. The engineers channeled the sewage into the bay.
- d. \*The bay channeled the sewage.

The type of thematic role possible in external argument position is a reflection of aspectual constraints on argument structure.

#### 4.3.2 External arguments and the translation of spatial delimitedness into temporal delimitedness

External arguments do not participate in delimiting linguistically described events in the same way that internal arguments do. Recall that the count/mass distinction of the internal argument translates into a delimited/non-delimited distinction in the verb phrases of affectedness verbs:

38

- a. Charlie drank beer. (non-delimited)
- b. Charlie drank a beer. (delimited)
  
- a. Laura shoveled snow. (non-delimited)
- b. Laura shoveled the snow in the driveway. (delimited)

-----

19. This is somewhat awkward, but colloquial in the author's dialect.

In the a) sentences, the internal argument is a mass noun and the sentence is non-delimited. In the b) sentences the noun phrase represents something countable and the sentence is delimited. This does not happen with external arguments:

39

- a. The heater dried the shoe. (delimited)
- b. Heat dried the shoe. (delimited)

40

- a. Snow surrounds the house.<sup>20</sup> (non-delimited)
- b. Seven trees surround the house. (non-delimited)

All the internal arguments in 39 and 40 are countable. In the a) sentences the external argument is a mass noun; in the b) sentences it is countable. 'Dry' is an affectedness verb, but the countability of its external argument has no effect on the delimitedness of the sentence. The sentence is delimited in both 39a and 39b, as we would predict for an affectedness verb with a countable direct argument. Whether the external argument is countable ('the heater') or not ('heat') has no effect on the delimitedness of the sentence. 'Surround' in 40 is a stative (in this usage), and the verb phrase is always non-delimited, regardless of whether its external argument is mass or count. A countable external argument ('seven trees') or a mass external argument ('snow') both yield a

-----

20. 'Surround' also has a non-stative usage: 'The cops surrounded the house.' I am only considering the stative usage here.

non-delimited sentence when used with a stative verb.

Delimitedness is a property determined exclusively by the verb and its internal arguments.

A digression is necessary here. There is an important difference between non-delimitedness associated with bare plurals and non-delimitedness associated with mass nouns. The delimitedness of a verb phrase containing an affectedness verb makes no distinction between a mass noun ((a) examples below) and a bare plural ((b) examples) in direct argument position. Either one has properties of mass-ness as opposed to countability and either one makes a delimited verb phrase:

41

- a. Charles drank beer. (non-delimited)
- b. Charles drank mugs of beer. (non-delimited)
  
- a. Laura shoveled snow. (non-delimited)
- b. Laura shoveled driveways. (non-delimited)

In the case of external arguments, however, there is a difference. While the mass-ness of a mass noun external argument does not contribute to the delimitedness of the sentence, that of a bare plural external argument can:

42

- a. The heater/heat dried the clothes. (delimited)
- b. Heaters dried the clothes. (delimited, non-delimited)
  
- a. The man/perseverance painted the wall. (delimited)
- b. Men painted the wall. (delimited, non-delimited)
  
- a. The child drew a circle. (delimited)
- b. Children drew a circle (each). (delimited, non-delimited)

All the verbs in 42 are affectedness verbs and all internal arguments are countable. All the a) sentences are delimited, as we would expect. These are the sentences in which the external argument is a single count noun or a mass noun. However, the b) sentences, with bare plural external arguments, have a non-delimited reading available as well. How is it that the massness of the bare plural external argument, but not of the mass noun external argument, may translate into non-delimitedness of the sentence?

The non-delimited readings above result from an interpretation in which each external argument performs a separate event. In other words, the event is iterated through the iteration of the external argument. For example, the sentence:

43

The linguists drank a beer.

may be understood to mean that all the linguists drank the same beer, in which case the event described is delimited within the verb phrase in the familiar way. The linguists are consuming together, a certain fixed quantity of beer. But it may also mean that the linguists drank separate beers, in which case each linguist's drinking of a beer was a separate event. The single event consisting of several beer-drinking events put together does not necessarily have a definite endpoint in time, since the linguists may drink their beers at

different indefinite times. This is the kind of non-delimitedness that arises out of the iteration of separate events an unspecified number of times. Since the events need not transpire at the same time, they may stretch out indefinitely over time. If the number of times is specified by having a count plural external argument, the sentence is delimited:<sup>21</sup>

44  
Five linguists drank a beer. (delimited)

We must distinguish this kind of non-delimitedness, which can interact with the external argument, from the delimitedness that depends on a single event, and which is only determined within the verb phrase. The delimitedness investigated in this thesis is of the latter type. (I will leave the nature of the former as a separate topic for research.) The verb phrase may be thought of as representing the unit event, which may or may not be iterated by the

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21. Verkuyl (1972) observed that bare plural indirect objects can also, under certain circumstances, impart non-delimitedness in the same way: 'Den Uyl overhandigde een uur lang het PVDA-speldje aan congresgangers' (translation from the dutch: "For an hour Den Uyl handed out the Labour Party badge to congress-goers".) In this example, the direct argument ('the Labour Party badge') is countable, but the indirect argument ('congress-goers') is a bare plural. The fact that the sentence is compatible with the adverbial expression 'for an hour' shows that it can describe a non-delimited event. The non-delimitedness is contributed by the bare plural indirect argument.

external argument.<sup>22</sup> It is the delimitedness of the unit event that is syntactically important in the ways described in this thesis.

#### 4.3.3 Summary

When the interaction of external arguments and delimitedness is examined closely, it is evident that external arguments do not contribute to the determination of delimitedness in the same way that internal arguments do. They cannot delimit the event through a scale as do the internal arguments of affectedness verbs. External arguments are independent of the event as measured out by the internal argument. They do not provide a scale for the event, so they are not required to be undifferentiated over time with respect to the event. The change that occurs in the external argument during the course of the event is not necessarily characterizable as a change in a single parameter.

#### 4.4 Oblique arguments

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22. This view of the verb phrase as representing the unit event is compatible with Schein (1986) who regards the verb phrase as a kind of aspectual domain. He represents the logical form of 'sum of plurals' readings and 'event dependent quantification' as (a) and (b) below, respectively:

- a. [Ee: VP(e)] INFL(e, NP)
- b. [Ae: VP(e)] INFL(e, NP)

The verb phrase in Schein's event logic is a restriction on quantification over events.

#### 4.4.1 Delimiting oblique arguments

Chapter 3 illustrated how direct arguments of certain verbs may delimit the event described by the verb. Indirect or oblique arguments, when they are sources and goals, are also delimiting expressions, as shown by these familiar tests with durative adverbials:

- 45
- a. push the car (non-delimited)
  - b. push the car for an hour
  - c. \*push the car in an hour<sup>23</sup>

- 46
- a. push the car out of the garage (delimited)
  - b. \*push the car out of the garage for an hour
  - c. push the car out of the garage in an hour
  - d. It took an hour to push the car out of the garage.

- 47
- a. push the car to a gas station (delimited)
  - b. push the car to a gas station for an hour
  - c. push the car to a gas station in an hour
  - d. It took an hour to push the car to a gas station.

The verb phrases 46b and 47b can have iterative interpretations in which they are understood to mean the car was pushed out of the garage or to the gas station over and over again during the hour. (46b has only the iterative interpretation and so is pragmatically odd. 47b has the semelfactive as well as the iterative interpretation.) 46c-d

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23. The adverbial test employs a particular reading of 'in an hour'. The relevant reading is that in which it takes an hour to push the car -- not the reading in which the car is to be pushed at some time beginning an hour from the present.

and 47c-d are grammatical with the expressions 'in an hour' and 'it took an hour to...', which indicate the events described are delimited.

Goal (and source) expressions delimit an event by marking an endpoint (or a beginning point) on the scale defined through the verb and its direct argument. In the sentences above, they mark an endpoint in the direct argument's change in location over time.

If there is a direct argument, a goal expression delimits the event in concert with that direct argument. If the direct argument does not delimit the event (if it is not an affected argument) a goal phrase delimits the event by marking an endpoint on a scale provided by the direct argument -- as in the sentences with 'push' above. If there is a delimiting direct argument (an affected argument) in the verb phrase, an additional goal only serves to specify the endpoint of the event whose existence is already established by the theme:

48  
eat an apple to the core  
perform a play to the fourth act

Heinämäki (1983) discusses this phenomenon in Finnish:

- 49
- a. Metsästäjä ampui lehmän  
hunter shot cow-ACC  
"The hunter shot a cow."
  - b. Metsästäjä ampui lehmän kuoliaaksi

hunter shot cow-ACC dead-to  
"The hunter shot a cow dead."

- c. Metsästäjä ampui lehmän silmäpuoleksi  
hunter shot cow-ACC eye-half-to  
"The hunter shot a cow and blinded the cow in one eye."

Recall that accusative case on the direct object in Finnish signals a delimited event, i.e. an event with some terminus. What terminus that is may be specified by a goal phrase, but the necessity of there being some terminus is indicated by the direct object itself. Heinämäki writes (Heinämäki (1983)

p.157):

We see that the accusative form of the object in itself does not semantically entail any particular result, such as death in case of shooting; it only entails the existence of a bound. The bound can be given explicitly, as in (49b,c). But how is the bound inferred in (49a)? The sentence denotes a telic situation, i.e. a situation that has a clear end point beyond which the situation cannot continue -- namely the death of the cow. Thus, if a sentence that has an accusative object denotes a telic situation, the telic endpoint is inferred to be the actual end point if no explicit bound is given in the sentence. But, as was said before, this inference is pragmatic and can be cancelled by explicitly giving some other bound. We also see from the examples in (49) that kuoliaaksi/silmäpuoleksi in (49b,c) are not independent bounds added on top of the accusative object, but rather specifications of the bound, the existence of which is implied by the accusative object.

A delimiting expression such as a goal cannot delimit the verb phrase independently of the scale established by the direct

argument.<sup>24</sup>

Source phrases also delimit an event:

50

- a. push the car (non-delimited)
- b. push the car out of the snowbank (delimited)

An event may be both inceptively and completely delimited:

51

push the car out of the snowbank into the river

However, within a verb phrase an event may be delimited at most once inceptively and once completely. Since complete delimitedness is much more prominent than inceptive delimitedness in natural language, I will discuss only complete delimitedness. In the remainder of this thesis 'delimitedness' will mean complete delimitedness.

A verb phrase may be delimited only once:

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24. A verb phrase with no direct argument can be delimited by a goal phrase. In this case the goal marks an endpoint on a scale provided by the verb's meaning, that would be manifested (in pure form) as a direct argument. Verbs of motion illustrate this point. 'Carmen walked to San Francisco' may be paraphrased as 'Carmen walked the distance to San Francisco'. Although the external argument of this sentence, Carmen, is the object with which the changing property of location is associated, Carmen's participation in the event is not represented as that changing property. Carmen is also an agent, engaging in activity not entirely characterizable as a simple change of location. The pure linguistic representation of that change must be manifested in a direct argument such as 'the distance' in the preceding example.

52

- a. \*push the car to New York to San Diego
- b. push the car to New York and push the car to San Diego
- c. push the car to New York and San Diego

53

- a. \*push the car out of the snowbank out of the river
- b. push the car out of the snowbank and push the car out of the river
- c. push the car out of the snowbank and the river

52a is ungrammatical even though it could pragmatically have the same meaning as 52b and 52c. 52a imposes two delimitings on the verb phrase. 52b, by repeating the verb, describes two separate events, one for each goal; and 52c merges the two cities into one goal phrase delimiting the one event expressed by the verb phrase. The same discussion applies to 53a through 53c.

Gruber (1965) investigated Source-Goal patterns in depth, and showed that certain kinds of verbs describing a change of location can have more than one goal phrase. (Gruber refers to these verbs as expressing 'Positional' transitions.) (Example 54 is from Gruber (1965).)

54

John sent the book to New York to Bill.

In these cases, Gruber notes, the second goal phrase serves to further specify the first. The preferred ordering of the two goal phrases is from general to specific:

55

\*John sent the book to Bill to New York.

Successive goal phrases are impossible with verbs describing

what Gruber refers to as 'Possessional' transitions:

56

\*John gave the letter to New York to Bill.

\*John gave the letter to Bill to New York.

Gruber explains the possibility of having more than one goal phrase as depending on the ability of the verb to have a goal which can be further specified (Gruber (1965) p.82):

The fact that the Possessional and Identificational differ from the Positional verbs in that they permit only one Source-Goal pair may be thought to follow from the fact that the specifications for possession and identity, once made, cannot be refined or elaborated upon. They are automatically of absolute specification. Position may be specified in greater degrees of accuracy.

In other words, even when there is more than one goal phrase present in a verb phrase, there is still only one terminus of the event expressed by that verb phrase.<sup>25</sup>

The preceding discussion leads to the conclusion that oblique arguments may be delimiting expressions but when they are, they are parasitic on the scale provided by the direct argument. Furthermore, a verb phrase may only be delimited once; i.e., there may be only one endpoint to the event represented by a verb phrase.

#### 4.4.2 A delimiting requirement on secondary arguments

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25. For most speakers, the second goal phrase is set off by a special intonation indicating it is a parenthetical and not a true goal phrase.

There is a class of verbs of change of location, including such verbs as `lay', `put', and `set' which are peculiar in that they require some extra delimiting expression in the verb phrase. They are awkward or ungrammatical when used with only a direct object, but they improve if some delimiting expression is added:

57

- a. \*lay the book
- b. lay the book on the table
- c. lay the book down

58

- a. \*set the saw<sup>26</sup>
- b. set the saw on the sawhorse
- c. set the saw on its side
- d. set the saw down

59

- a. \*put the pot
- b. put the pot on the floor
- c. put the pot there
- d. put the pot down

Like the verbs of imparting motion, these verbs describe situations in which the direct argument undergoes a change of location. The expressions in the b), c), and d) examples above, which delimit the event or act of laying, setting, or putting; do so by marking the endpoint on a scale `measured out' by the object's changing property of location. This is

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26. There is an acceptable sentence like 59a in which `set' has an entirely different meaning: to prepare something for use, or to choose the settings or parameters on instruments. This is not the relevant reading. The usage of `set' I am concerned with is parallel to `put'.

what rate adverbials and degree expressions modify:

60

set the saw down slowly  
put the pot down slowly

61

set the saw a little further away  
put the pot a little more towards the door

These particular verbs require extra delimiting expressions in the verb phrase, because they describe events which must be linguistically delimited, but which are not delimitable through the direct argument alone. The verb is incomplete, in a sense, without the delimiting expression.<sup>27</sup> This leads to another hypothesis about delimiting expressions in the verb phrase. If the verb requires some other expression besides a direct argument to be in the verb phrase, that expression will be delimiting. If we take the distinction between arguments and adjuncts to be the following: arguments are required by the verb, in order to make a grammatical sentence, whereas adjuncts are optional, then secondary arguments (NP's required by a verb in addition to a direct argument NP) are always delimiting expressions.

This is also true of verbs entering into double object

-----

27. These verbs, in combination with the extra delimiting element may be complex affectedness verbs. Middles are awkward but do not seem beyond hope: 'This heavy saw sets down like a dream with this new handle attachment.' The fact that they are complex verbs may make the middles more difficult to process than they would otherwise be.

constructions,

62

give John a book  
build John a house

in which both `John' and `book' or `house' seem to be objects of the verb. The object `John', which I will call the dative object, may also occur in a delimiting expression rather like a goal phrase:

63

give a book to John

With the verb `build', the dative argument occurs with the preposition `for', where it may have a benefactive or a recipient reading:

64

build a house for John

The benefactive reading does not delimit; the recipient reading does. When the dative is in a double object construction (as in 62 above) the recipient or delimited reading is selected.

This is true of other double object verbs:<sup>28</sup>

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28. 63a and 63d are admittedly a little awkward because `give' expresses an event with little or no duration, while `in an hour' assumes the event has some duration. 64b and 64e are somewhat possible if `build' is not understood as an affectedness verb. In spite of these complicating factors, there is a clear difference in grammaticality that indicates

65

- a. give John a book in an hour
- b. \*give John a book for an hour
- c. It took an hour to give John a book.
  
- d. give a book to John in an hour
- e. \*give a book to John for an hour
- f. It took an hour to give a book to John.

66

- a. build John a house in a day
- b. \*build John a house for a day
- c. It took an hour to build John a house.
  
- d. build a house for John in a day
- e. \*build a house for John for a day
- f. It took an hour to build a house for John.

There is a clear difference in grammaticality between the verb phrases modified with 'for an hour' and those modified with 'in an hour', indicating that these expressions with dative arguments are delimited expressions. The delimitedness is contributed by the dative argument -- in some cases jointly with the accusative argument. Double object constructions will be discussed in greater detail in Chapter 5.

#### 4.5 Summary

Four principles of argument structure have been advanced in this chapter:

(1) If an internal direct argument undergoes change during the event described, that change is characterizable as a change in a single parameter or change on a scale.

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the sentences are delimited.

(ii) Events are described linguistically as delimited through the scale provided by the direct argument, and they are delimited within the verb phrase; i.e., an event may be linguistically delimited by an internal direct or indirect argument, but not by an external argument.

(iii) There may be at most one 'delimiting' associated with a verb phrase.

(iv) Secondary arguments are delimiting expressions.

Chapter 5 will examine the consequences of these principles for syntax. In Chapter 6 we will see how far these principles go toward explaining the mapping of cognitive structure into syntax.

## Chapter 5. Syntax of a Theory of Aspect

### 5.1 Introduction

Chapters 1 through 4 have argued that the semantic property of aspectual delimitedness is relevant and accessible to syntax. Chapter 5 is somewhat of a digression, and will tackle two specifically syntactic questions in which aspect bears on syntax. The first concerns the place of aspectual markers in X-bar theory, and the second concerns the interaction of aspectual principles of phrase structure with the syntax of double object constructions. I will not get much beyond posing the questions and will leave much unanswered. However, this will support one of my central theses; that syntactic questions may be posed partly in aspectual terms.

To begin with, a brief review of the history of aspect in government and binding theory is in order. The earliest models of generative grammar employed context-free rewrite rules that expressed the possibilities of recursion and linear ordering in natural language. In Chomsky (1965), tense, modality and aspect were introduced under the auxiliary node (AUX) at the level of the verb phrase.

1  
AUX --> Tense (Modals) Aspect  
S --> NP AUX VP

It was evident that context-free phrase structure rules were

inadequate for handling the distribution of tense, aspect, modality and agreement morphemes. This was one reason for the drive to eliminate such rules from the grammar. In Chomsky (1955) and Chomsky (1982) a transformation was employed to move the verbal inflection from its position in Deep Structure onto the verb. Tense and agreement morphemes were generated together under the inflection node (INFL) and moved to their position on the verb by a movement rule. INFL was viewed as the head of S in the X-bar phrase structure system. In Chomsky (1986) the movement uniting a verb and its inflection was subsumed under the general process of movement-to-head, by the proposal that the verb moves into the INFL position where it amalgamates with its inflection.

Steele et al (1981) argued that AUX was an independent syntactic category. They did not subdivide AUX into syntactic categories, so Aspect was grouped with Tense, Modality etc., under their approach. By treating INFL as the head of the clause, the current tradition of generative syntax expresses the intuition that tense, modals, and agreement take scope over the clause. The intuition that aspect takes scope over the VP rather than the clause was expressed indirectly in Emonds (1986) who placed English aspectual markers under the VP node in his phrase structure rules. In section 5.2 I will suggest that Aspect is an independent syntactic category, separate from INFL.

## 5.2 Aspect and phrase structure

The discussion in Chapters 1 through 4 has concentrated on the semantic property of delimitedness and its repercussions in syntax. Apart from the discussion in section 2.4, very little has been said about syntactic markers of aspect -- words and morphemes that specifically affect, alter or represent the property of delimitedness. In this section I will address the question of how aspectual markers such as these are related to phrase structure. In particular, I will argue that aspect is a syntactic category, and I will consider several possible instantiations of aspect in syntactic phrase structure. This last issue will be left partly unresolved.

There are a variety of types of words and morphemes that have been generally considered 'aspectual', but I will only address those that are 'aspectual' in the sense intended here -- they have to do more or less directly with delimitedness.<sup>1</sup> I take this approach because the primary topic of investigation in this thesis is delimitedness; and because I have adopted the assumption that delimitedness is one of the

-----  
1. Aspectual markers that indicate properties other than delimitedness may contribute 'meanings' based indirectly on delimitedness. For example, some languages have markers of iterativity in their verbal morphology. These indicate that a linguistically described event is to be understood as happening again and again. An event must be delimited in order to be interpreted in such a way. It is possible that all or most aspectual meanings are built in some way on delimitedness, but I will leave this as an open question.

central, if not the central property --, or feature -- expressed by the category of aspect. This assumption is supported by the evidence in Chapters 1 and 2 for the syntactic importance of delimitedness. I will assume that aspectual markers of delimitedness are syntactically representative of a larger category of aspectual markers. (The detailed working out of this idea must be left for further research.) There are many obstacles to this approach -- not least of which is the overwhelming complexity and variety of tense and aspect phenomena across languages, certainly beyond the scope of this thesis. But in order to make any headway in the investigation of such complex phenomena as aspect, it is necessary to constrain the investigation by narrowing the the line of approach to the problem.

The argument that aspect is a syntactic category will proceed along the following lines. I will show that aspectual markers cannot be part of INFL, and they cannot be simply features on the verb. They have a syntactic identity and distribution of their own.

### 5.2.2 Semantic independence of tense/modality and aspect

In considering the differences between these various syntactic representations I will begin, perversely, with a semantic discussion. The grouping of tense, modality and aspect together with agreement (AGR) under the category

inflection (INFL) runs counter to their semantic groupings. In this section four points will be discussed, supporting the view that aspect and tense/modality should be semantically distinguished. I will not include a discussion of AGR, since it is semantically orthogonal to both tense and aspect.

(1) First, tense and modality have quite different semantic functions from aspect. Tense markers may locate an event temporally with reference to some point in time that cannot be fixed solely by the grammar or by the sentence. Usually this is the present moment, or the moment a linguistic expression is uttered. Modality also refers to contextual or extra-grammatical information when it indicates such things as the speaker's opinion about the supposed truth or falsity of a proposition; or how the statement is used as communication among individuals (e.g., as a statement, question or command). These kinds of modal 'meanings' cannot be interpreted in a linguistic expression without knowledge of who the speaker is, or how the sentence is used. In this respect, tense and modality are indexical. Aspectual delimitedness, however, is not. It is a property of linguistically described events, one which is grammatically indicated and does not require reference to contextual information in order to be interpreted.

(2) Secondly, the same inflectional forms are often used for tense and modality (e.g. 'will'), but morphemes that express

both aspect and tense or aspect and modality are rarer. They do not exist in English, and I have seen no incontrovertible evidence of such forms in other languages.<sup>2</sup> Furthermore, tense and modality often seem to merge semantically as well as morphologically; future times may easily be expressed as possible times, for example.

(3) Third, as discussed in Chapter 2, delimitedness may be compositional, having to do with the interaction of a verb and its internal arguments. Tense and modality are not. This demonstrates that the tense/modality system and the aspect system have very different mechanisms for semantic interpretation.

(4) Fourth, aspectual delimitedness is interpreted independently of tense and modality. It is true that tense and modality sometimes appear to affect the interpretation of the temporal organization of a linguistically described event. However, tense/modality and delimitedness are independent. This is illustrated in the remainder of this

-----  
2. It is possible to find single morphemes that seem to express meanings incorporating aspect and tense. But this is often due to independent semantic or pragmatic restrictions on what tenses and aspects may occur together. In these cases, it is possible that the morpheme directly expresses either tense or aspect, and independent principles constrain the tenses or aspects that may co-occur with that specifically indicated by the morpheme. To contradict (2) above it would be necessary to find morphemes clearly indicating aspect and morphemes clearly indicating tense, that have the same syntactic distribution.

section, where the interaction of delimitedness with the English past, present and future forms is examined.

The English past tense imposes a temporal end to a linguistically described event in a sense, simply because the event has happened in the past and is therefore easily understood as not happening in the present. An event that is past has reached a definite temporal endpoint, but that is not the same as being delimited in the sense we are investigating. Consider the sentences:

3	Dustin ate the apple.	(delimited)
	Dustin slept.	(non-delimited)

In both of these sentences, the past tense imposes a finite duration on the event described, but the delimitedness of the first sentence and the non-delimitedness of the second are preserved. Dustin may have slept a day or a year (an indefinite stretch of time), but he only ate the apple until the apple was finished (a definite stretch of time). Durational adverbials show that the delimited/non-delimited distinction is preserved:

4	Dustin ate the apple (?for an hour/in an hour).	(delimited)
	Dustin slept (for an hour/??in an hour).	(non-delimited)

The English present tense has many peculiar properties. Stative verbs in the present tense have a natural interpretation as describing a situation that continues over

an indefinite stretch of time:

5  
Chizuko loves her grandchildren.

but non-stative verbs are odd in such an interpretation:

6  
?Keith climbs a tree.

Non-statives tend to be shifted into habitual or narrative interpretations in the present tense:

7  
Keith climbs a tree every morning. (habitual present)

This is what happened to Keith: This bear comes up out of the woods and starts chasing him down the trail, and Keith climbs a tree to get out of its reach... (narrative present)

The oddity of the English present tense is related to the question of whether present time is interpreted as an interval or as a moment.<sup>3</sup> It is not my purpose to discuss the English present tense here, but to illustrate the point that extraneous and poorly understood phenomena enter into the interpretation of the present tense, which may complicate judgements about delimitedness. Nevertheless, delimitedness is clearly preserved under the present tense. Consider these sentences in the habitual present:

-----

3. See Dowty (1979) for more discussion.

8

Keith eats an apple every morning.  
Keith sleeps every morning.

In the events as they are described above, it takes Keith a definite length of time to eat an apple (every morning), whereas he sleeps for an indefinite length of time (every morning). The durational adverbial tests support these judgements:

9

Keith eats an apple (?for an hour/in an hour). (delimited)  
Keith sleeps (for an hour/??in an hour). (non-delimited)

The English future form, marked by the modal 'will', may have a temporal or modal interpretation. The sentence:

10

The house will burn.

may indicate that the burning of the house will take place in the future, or it may imply the present or future possibility of the house's burning (i.e., the house is something that would burn if it were exposed to fire). In either reading the aspectual delimitedness of the verb phrase is unaffected:

11

Keith will eat an apple (?for an hour/in an hour). (delimited)  
Keith will sleep (for an hour/??in an hour). (non-delimited)

Tense may obscure the speakers's judgements about delimitedness, but on further consideration it is clear that delimitedness is independent of tense. Although both tense

and aspect deal with the temporal nature of events, tense is orthogonal to aspectual delimitedness.

This is also true of the relationship between modality and aspect. Markers of modality can introduce particular aspectual properties of their own. 12a below clearly describes a delimited event. Native speakers report an intuition that 12b describes a non-delimited event:

- 12  
a. Keith ate an apple.  
b. Keith can eat an apple.

Nevertheless, the delimited/non-delimited distinction is preserved under the modal 'can':

- 13  
Keith can eat an apple in an hour/\*for an hour.

Delimitedness is also independent of adverbials of time. Durational adverbials can impose a definite length of time on an event, but when they do, the distinction between delimited and non-delimited sentences is unaltered:

- 14  
Keith slept for three hours.  
Keith climbed a tree for three hours.

In the sentences above, the events of sleeping and tree-climbing are expressed as having a definite duration over time, but tree-climbing may be understood to have happened iteratively, whereas there is only one event of sleeping

expressed. The distribution of semelfactive and iterative readings that is determined by the property of delimitedness is preserved. Even though the adverbials impose a definite duration on the events, they do not obliterate the delimited/non-delimited distinction.<sup>4</sup> Tense, modality and temporal adverbials do not enter into the determination of aspectual delimitedness.

These four semantic reasons for separating aspectual delimitedness from tense and modality have been reviewed:

- (i) Tense and modality refer to extra-grammatical, contextual information. Delimitedness does not.
- (ii) Tense and modality often merge morphologically or semantically. This is less apparent with aspect and tense or aspect and modality.
- (iii) Aspect is compositional. Tense/modality is not.
- (iv) Delimitedness is interpreted independently of tense.

The fact that tense/modality and aspect are semantically distinct is not sufficient grounds for separating them syntactically as well, but it is circumstantial evidence in favor of it. The basic syntactic categories of nouns, verbs, adverbs, adjectives, determiners, etc. are quite distinct

-----

4. There is precedent, in the literature on tense, for treating time adverbials semantically as part of the tense system. In Reichenbach (1947) and Smith (1978), adverbials help determine the reference points around which the interpretations of tenses turn. In Hornstein (1977) adverbials map directly onto some of these reference points. Tense and adverbials of time may be treated naturally as part of a system of time reference that is distinct from aspect and delimitedness.

semantically; and the correlation of semantic with syntactic distinctions is well-attested in natural language. However, the proof of the pudding lies in the syntax.

### 5.2.3 Syntactic independence of tense/modality and aspect

Consider the English progressive marker, 'be -ing'. It has the function (among other things) of making a verb phrase describe a non-delimited event:

15

Harry was eating an apple for an hour.  
?Harry was eating an apple in an hour.

Harry was sleeping for an hour.  
\*Harry was sleeping in an hour.<sup>5</sup>

The semantic function of the English progressive cannot be described as simply converting a delimited reading into a non-delimited one -- it is more complicated than that. I will not attempt to describe its 'meaning' here. However, since part of its function is clearly to change delimitedness into non-delimitedness, I will consider it, for syntactic purposes, to be an aspectual marker of delimitedness.

'Be -ing', has a different syntactic distribution from tense/modality. Syntactic constraints on the occurrence of tense/modality markers are irrelevant for aspect. English

-----  
5. This is a good sentence if it is understood inceptively, to mean: 'Harry fell asleep within an hour'. This is not the use of 'sleep' that I am considering here.

tense/modality must co-occur with a lexical subject or trace.  
It cannot co-occur with PRO:

16		
*Steve wants PRO goes to Vermont.		PRES
*Steve wants PRO went to Vermont.		PAST
*Steve wants PRO will go to Vermont.		MOD

`Be -ing' may occur where tense may not:

17		
Steve wants PRO to be going to Vermont.		be -ing

The English perfective marker `have -en' patterns together with `be -ing' in this respect. It is reasonable to assume that it also belongs to the syntactic category of aspect. This is not surprising, because it expresses non-indexical `meaning', although its connection with delimitedness is less straightforward. <sup>6</sup>

The relative ordering of tense/modality and aspect morphemes provides some indirect support for separating aspect from tense/modality (although it is not particularly strong evidence in favor of the idea). The ordering is partly explained if aspect and tense/modality are two separate syntactic categories. When more than one of these markers occurs together with tense/modality in a string of morphemes,

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6. English aspectual verbs such as `begin -ing' and `finish -ing' have a distribution similar to `be -ing', and also affect delimitedness. They may also belong to the category aspect, but I will not discuss them.

tense/modality occurs at the edge of the string, and aspect occurs closer to the verb:

18

Sung-hee has been going	PRES - have-en - be-ing - go
Sung-hee had been going	PAST - have-en - be-ing - go
Sung-hee will have been going	MOD - have-en - be-ing - go

If tense/modality markers and aspect markers belonged to the same syntactic category it would be possible (though not necessary) for them to be interspersed in a string of morphemes:

19

*Sung-hee have is going.	have-en - PRES - be-ing - go
*Sung-hee have be goes-ing.	have-en - be-ing - PRES - go

A general pattern is apparent in the distribution of tense/modality and aspect: tense/modality is farther from the verb, and aspect is nearer to it. Assuming there are no discontinuous constituents, all elements of verbal morphology belonging to one syntactic category should be separated from all elements of verbal morphology belonging to another syntactic category by a syntactic interface or boundary. The distribution of tense and aspect morphemes discussed above is consistent with this condition. Within that general pattern, we see that aspect markers are not freely ordered, but constrained within a fixed ordering. The fact that they have a fixed order does not mean they cannot belong to the same syntactic category. This ordering can come from independent constraints not related to phrase structure and constituency.

It is common for verbal morphology to have a somewhat arbitrary fixed ordering that is particular to the language. There is more reason to unite 'have -en' and 'be -ing' in one category than to separate them into two.

The relative ordering of tense/modality and aspect morphemes does not require that they be separate categories, but if they are separate categories, some of the facts about their relative ordering will follow.<sup>7</sup>

The data in this section demonstrates that tense/modality and aspect belong to separate syntactic categories. Furthermore, it favors an analysis in which tense/modality takes syntactic scope over aspect, or aspect and verb together make up a constituent which does not include tense/modality:

20

Sung-hee has gone.	(PRES (have-en go) )
Sung-hee was going.	(PRES (be-ing go) )

On the basis of considerations such as these, Emonds (1976) excludes 'be -ing' and 'have -en' from being generated in deep structure under the category AUX (auxiliary). (Instead, in Emonds' analysis, they are generated as syntactic main verbs,

-----

7. If semantic or morphological merger only occurs under conditions including adjacency at surface structure, then this view predicts that if tense and aspect ever merge in single morpheme, that morpheme should be at the syntactic boundary between the two categories.

under the VP node.) Emonds (1976) provides a precedent for syntactically separating aspect from tense and modality. On the basis of the data discussed in this section, any phrase structure in which tense, modality and aspect are all grouped together under the INFL node must be rejected.

### 5.2.3 Against a strictly featural account of aspect

It is possible that aspect could be syntactically distinct from tense/modality and still not be an independent category, if aspect markers merely represent feature bundles attached to a main verb. In this case aspectual markers could not claim an independent node in phrase structure as they would if they were a true syntactic category. It is clear that 'be -ing' must occupy a separate node from the main verb of a clause, simply because it has lexical identity of its own. Adverbs may intervene between 'be' and the main verb:

20

Lisa was slowly walking down the road.  
BE -ING

However, it may also be argued that some markers of delimitedness that are bound morphemes also have independent syntactic status from the main verb. Eckert (1984) observed that similar aspectual markers in Russian and Czech can be characterized as differing minimally in relative scope: The Russian imperfective marker must be used whenever a verb is used in an iterative context, regardless of the aspectual





The corresponding Czech imperfective may be represented as taking scope only over the verb:

24



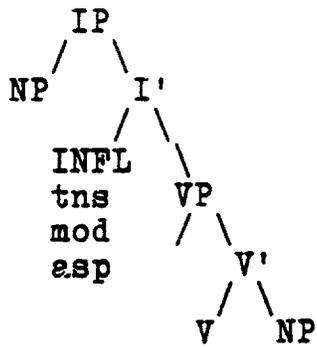
If the difference in relative scopes of aspectual markers such as these is to be represented syntactically, the aspectual markers must have syntactic reality, and it must be possible for them to occupy independent syntactic nodes. Abney (1987) and Baker (1986) argued that phonological and syntactic word-hood do not necessarily coincide. It is not therefore surprising to find that some aspectual morphemes may be represented as syntactic words. Lumsden (1987) argues that all grammatical features (features associated with functional categories) are syntactic features and are heads of syntactic phrases. If this is true it is further support for the plausibility of a syntactic category of aspect.

#### 5.2.4 Possible instantiations of aspect in phrase structure

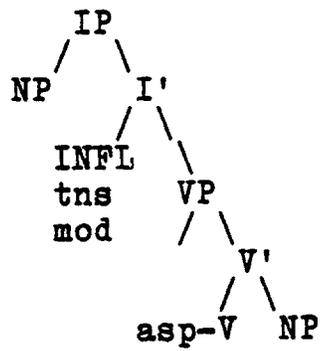
Adopting two plausible assumptions; that aspect is a syntactic category, and that it conforms to the principles of X-bar theory; there are several ways in which syntactic markers of aspect could be manifested in phrase structure. These are illustrated below. (AGR is omitted from these

structures because it is irrelevant to the discussion.)

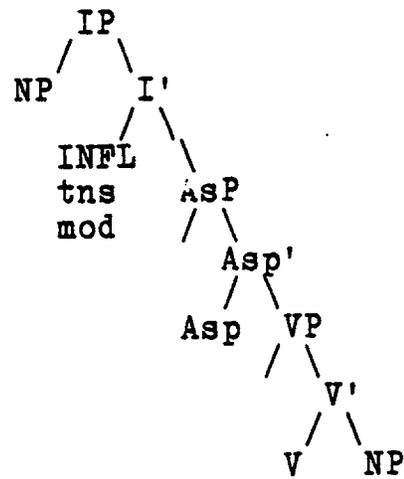
25  
a)



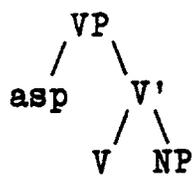
b)



c)



d)

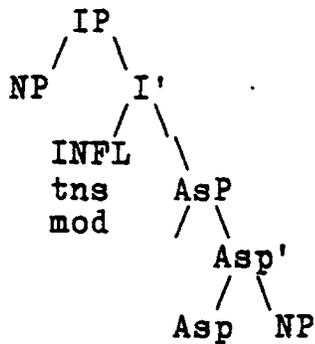


In 25a above, tense, modality and aspect are subsumed under the single syntactic category of INFL (together with AGR). In 25b, aspect is distinct from tense and modality, but is not syntactic. It is a bundle of features affixed to the verb, and contained within the V node. In 25c aspect is a syntactic category and a head, which takes the VP as its complement. In 25d aspect is a syntactic category that is not a head, but a specifier.

Sections 5.2.1 through 5.2.3 have argued against phrase structures 25a and 25b. However, there is another way to look at phrase structure 25b. Aspectual features on the verb will be percolated up the projection.<sup>9</sup> This is correct insofar as the verb does contribute some aspectual features of its own to the verb phrase. Recall that the verb phrase is a kind of aspectual domain. Some aspectual markers have been analysed as embedded main verbs (e.g., Emonds (1976)). If the features on the head of the VP are aspectual, and the VP is an aspectual domain, and 'be -ing' and 'have -en' are indeed embedded verbs, it could be the case that aspect and verb should be subsumed under a single category that heads a phrase:

-----  
9. Lieber (1980) and Selkirk (1982) discuss feature percolation.

25e



25e is quite conservative; it looks like little more than a renaming of the verb phrase as an aspect phrase. It is not far removed from Emond's analysis. I leave it as an open question whether this structure makes different predictions from a structure in which a verb projects to a verb phrase.

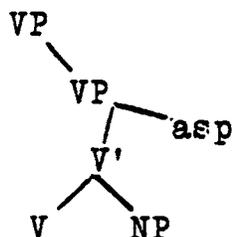
We must consider the remaining possibilities, 25c, 25d and 25e. 25c and 25e are two possible ways in which the syntactic category of aspect might head a syntactic phrase. 25c predicts that an aspect phrase may be distinguished from a verb phrase. To investigate this possibility properly it would be necessary to find a language with aspectual morphology that tells upon the question. (English is not such a language.) It is possible that 25c is an option in universal grammar not fully instantiated in many or even most languages.

25d, in which aspect is a specifier of the verb phrase, is attractive because, as the Russian and Czech data illustrate, some aspectual markers seem to have scope-taking

properties.<sup>10</sup>

This question of whether aspect is a head or a specifier is parallel to the discussion of whether DET (determiner) is a specifier for N or whether it heads its own projection.<sup>11</sup> There are members of both the categories of aspect and determiner that seem to have scope-taking or quantifier like properties. Both Aspect and DET contain purely functional information that is also associated with the verb or noun. DET determines in large part whether the NP or DP will be mass or count, and Aspect determines whether the verb phrase or aspect phrase will be delimited or non-delimited. This is so even though there is information about the mass/count or delimited/non-delimited distinction in the noun or verb itself. Whether aspectual markers of delimitedness are heads of phrases or specifiers is a question that is beyond the

-----  
10. Peggy Speas has suggested another structure in which aspect is not a head or a complement. This is an adjunction structure like the following:



It is not clear how this structure would differ from 25d in the predictions it makes. I leave this as an open question.

11. See Abney (1987), Fukui and Speas (1986), and Speas (1986) on functional categories.

scope of this thesis to answer, although it is appropriate to pose it here. To answer this question it will be necessary to investigate the interaction of particular aspectual morphologies with the theory of functional categories, binding theory and bounding theory. This is a timely question, coinciding as it does with the research that is developing on the nature of functional categories.

### 5.3 Aspectual particles, resultative secondary predicates, and double object constructions

Aspectual particles, resultative secondary predicates, and the dative arguments of double object constructions have much in common syntactically. In this section the common syntactic behaviors of these elements are reviewed, and considered in light of the aspectual theory of argument structure developed in Chapter 4. I hope to accomplish two purposes in this section: first, to show that aspectual principles unify these three kinds of syntactic elements and account for some of their behavior; and second, to illustrate how an aspectual theory of argument structure may be brought to bear on a syntactic question. For the second project I will concentrate on double object constructions. I will not develop an original analysis of these constructions, but will discuss and choose between existing solutions in the literature on the subject. The conclusions reached will be few and tentative, but sufficient to illustrate how aspect may be employed as a tool in syntactic investigation. The aspectual theory advanced here allows interesting questions to be posed, most of which I will have to leave for further research.

Aspectual particles and resultative secondary predicates have been discussed in Chapter 2. Double object constructions have not yet been discussed, and will be introduced here.

Double object constructions are exemplified by 26a below.

They are distinguished from prepositional datives as exemplified in 26b:

26

- a. Margaret sent Mary a package.
- b. Margaret sent a package to Mary.

These constructions have received a great deal of attention in the literature. A variety of analyses have been suggested for them, focusing on the questions of (i) what is the syntactic structure of 26a, and (ii) how are sentences like 26a and 26b related? 26a and 26b differ crucially in that the dative object is governed by the verb in 26 a but not in 26b. There are three general ways in which the two constructions may be related:

(i) the dative object (but not the accusative object) is base generated in a position where it is governed by the verb, and moved to a position where it is not (26a is the basic form, and 26b derived),

(ii) the accusative object (but not the dative object) is base generated in a position where it is governed by the verb, and moved to a position where it is not (26b is the basic form, and 26a derived),

(iii) each form is base generated, and no derivational movement necessary (26a and 26b are both base generated).

These are general sketches of three possible approaches.

Naturally there are many refinements and variations on these approaches developed by the authors who have worked on these constructions. These variations have to do with explaining the presence or absence of the preposition, or postulating

intermediate derivational structures. Several types of rules inserting or deleting prepositions, or converting NP's into PP's and vice versa, have been employed. I I will not discuss these.

All three of these general approaches are represented in the literature. Emonds (1972) argued that 26b was the base generated form and 26a was derived from it by a transformational rule permuting the dative and accusative arguments.<sup>1</sup> Oerhle (1976) and Kayne (1981) proposed that 26a and 26b were both base generated. Fillmore (1965) adopted an analysis in which the prepositional dative is derived from the double object construction.<sup>2</sup> Chomsky (1975) and Larson (1987) adopt analyses in which the base generated form is closer to 26a than 26b, but the relationship between the two forms is more complicated in their analyses.<sup>3</sup>

-----  
1. It has come to my attention that Stowell (1981) also adopted an analysis in which the double object is derived from the prepositional dative.

2. Fillmore (1965) proposes a deep structure like 26a for 'to' datives and particles, but not for 'for' datives.

3. Chomsky (1975) proposes a deep structure in which the dative object forms a constituent with the verb:

the teacher -- gave to him - several books

In Chomsky (1975) the prepositional dative (a below) is derived from the sentence above, and the double object (b below) derived in turn, from the prepositional dative.

a. the teacher gave several books to him

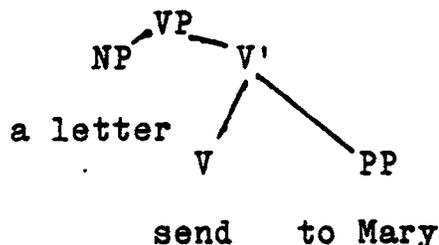
This quick overview to the literature on double object and prepositional dative constructions has focused on the deep structure configurations ascribed to these constructions. In Chapter 4, a correlation between deep structure position and aspectual properties was proposed, and it is this correlation that is the topic of this chapter.

Six unifying characteristics of aspectual particles, resultative secondary predicates, and dative arguments of double object constructions are described below. Generalizations 1 through 4 are more or less familiar to linguists working on these issues. Generalizations 5 and 6 concern the aspectual properties of these constructions, and they are contributed by the view of aspect developed in this thesis.

1. Each one of these constructions requires a postverbal NP or accusative object. The aspectual particles are underlined

-----  
 b. the teacher gave him several books

Larson (1977) proposes a deep structure like the following:



Both the double object and the prepositional dative constructions are derived by Larson from this structure by operations such as verb raising and adjunction.

in the sentences below:

27

a. John ate an apple up.  
John pushed the table over.

b. \*John ate up.<sup>4</sup>  
\*John pushed over.

Sentences in which there is an aspectual particle but no postverbal NP involve unaccusatives or middles, and these have a NP trace in the postverbal NP position.<sup>5</sup>

28

a. Martha dried her socks out.

b. The socks<sub>i</sub> dried t<sub>i</sub> out.<sup>6</sup>

c. The socks<sub>i</sub> dry t<sub>i</sub> out-easily by hanging them up.

d. \*Martha dried out. (where Martha is drying something out)

In 28a there is an overt postverbal NP, just as in the preceding set of examples. In the unaccusative (28b) and the middle (28c), there is a NP trace in postverbal position. In (28d) there is neither a NP trace or an overt NP, and the sentence is bad.

-----

4. This is good for some speakers if interpreted with a deleted object, in which case there is still an understood postverbal NP.

5. The movement analysis for unaccusatives and middles is reviewed in Chapter 6.

6. I am not taking a stand on whether the NP trace is before or after the particle. It is placed before the particle merely for convenience.

The same is true of resultative secondary predicates. They require postverbal NP's which may be overt;

29

John scrubbed the floor clean.  
John wrung his towel dry.

or they may be traces associated with unaccusatives;

30

The lake<sub>i</sub> froze t<sub>i</sub> solid.  
The river<sub>i</sub> drained t<sub>i</sub> dry.

or with middles:

31

John<sub>i</sub> scrubs t<sub>i</sub> clean easily if you can hold him down long enough. (Said of a small child who hates to be scrubbed.)

But resultative secondary predicates without a postverbal NP or trace are ungrammatical:

32

\*John scrubbed clean. (where John scrubbed something clean)

Finally, the dative argument of a double object construction requires the presence of the accusative argument. The dative arguments are underlined in 33 below. The accusative arguments are 'a letter' and 'a package'.<sup>7</sup>

-----  
7. Just as with the aspectual particles, there are acceptable constructions in which the accusative argument is understood: 'Kazuko read to Taroo' means that Kazuko read something to Taroo.

33

Tifa sent a letter to Muhend.

\*Tifa sent to Muhend.

Kazuko mailed a package to Taroo.

\*Kazuko mailed to Taroo.

2. These three elements, with some minor qualifications, may occur on either side of the postverbal NP or accusative object. This is clear in the case of aspectual particles:

34

Mario ate an apple up.

Mario ate up an apple.

Murry pushed the table over.

Murry pushed over the table.

Marcus dried his socks out.

Marcus dried out his socks.

and it is clear for dative arguments:

35

Tifa sent a letter to Muhend.

Tifa sent Muhend a letter.

Kazuko mailed a package to Taroo.

Kazuko mailed Taroo a package.

Resultatives require a minor qualification. They are generally not as good before the postverbal NP (36b) as after it (36a). (The examples in (36a) are from Carrier-Duncan and Randall (1987).)

36

a. The gardener watered the tulips flat.

The baker beat the eggwhites into stiff peaks.

- b. ??The gardener watered flat the tulips.  
\*The baker beat into stiff peaks the eggwhites.

However, the sentences in 36b above improve greatly when the postverbal NP is heavily weighted phonologically and informationally:

37

The gardener watered flat the tulips that she had planted the week before and had not expected would ever come up.

?The baker beat into stiff peaks the eggwhites that his assistant had made a special trip to a neighborhood farm to get fresh eggs for.

Assuming the resultatives in postverbal position are not prohibited by strict principles of grammar, but by principles of felicity in discourse or style such as those that govern Heavy NP Shift, resultatives, like aspectual particles and dative arguments, may appear before the postverbal NP or accusative object.

3. Particles, resultatives, and dative objects must be unique in the verb phrase. The grammatical (a) and (b) sentences below contain one of these syntactic elements. In the ungrammatical (c) examples there are two of these elements.

38

- a. John ate the apple up.  
b. John ate the apple through.  
c. \*John ate the apple up through.
- a. John pushed the cart over.  
b. John pushed the cart away.  
c. \*John pushed the cart over away.

39

- a. John scrubbed the floor clean.
- b. John scrubbed the floor dry.
- c. \*John scrubbed the floor clean dry.

- a. The lake froze solid.
- b. The lake froze hard.
- c. \*The lake froze solid hard.

- a. The gardener watered the tulips flat.
- b. The gardener watered the tulips sopping wet.
- c. \*The gardener watered the tulips flat sopping wet.

40

- a. Tifa sent a letter to Muhend.
- b. Tifa sent a letter to Izir.
- c. \*Tifa sent a letter to Muhend to Izir.

4. The verb and the particle, resultative or dative object are more tightly related thematically than the verb and the postverbal NP or accusative object. This was observed by Emonds (1976) with respect to a verb and its dative object. (The examples in 41 are from Larson (1987).)

41

Mary took Felix to the cleaners.  
                                          to task.  
                                          into consideration.

Felix threw Oscar to the wolves.

In these examples, the verb and its dative object jointly select the accusative object. The existence of many such idioms consisting of a verb and dative object that together select the accusative object is evidence that a verb and its dative object together assign thematic roles to the accusative object.

Aspectual particles are quite productive, but it is not the

case that any particle can occur with any particle-taking verb. There are selectional restrictions between the verb and the particle:

42

eat an apple up  
\*eat an apple out  
?eat an apple through  
  
?dry the socks up  
dry the socks out  
\*dry the socks through  
  
\*hear the story up  
hear the story out  
hear the story through

Moreover, the verb and particle together select the postverbal NP, rather than the verb and postverbal NP selecting the particle. This is a subtle effect to test for, because the range of 'meanings' contributed by the aspectual particle to the linguistic expression is quite limited. These aspectual particles require that the postverbal NP argument is entirely affected, but they may express slightly different ways of being entirely affected. 'Up' in 'dry up' implies a complete drying of the surface of the object, while, 'out' in 'dry out' has more of a sense of drying the object completely from inside to outside. 'Up' and 'out' in concert with 'dry' can select for different accusative objects:

43

\*dry the socks up  
dry the socks out  
  
dry the floor up  
??dry the floor out

This is much easier to see with resultatives. First of all it is clear that there is a thematic interaction between the verb and the resultative:

44  
water the tulips flat  
?water the tulips rough  
\*water the tulips dry  
  
wring the towel dry  
?wring the towel flat  
\*wring the towel cold

Secondly, a verb and resultative together select the accusative object. If the resultative is not incompatible with the verb, then it selects the accusative object in concert with the verb:

45  
water the tulips flat  
?water the sidewalk flat  
  
?water the tulips shiny  
water the sidewalk shiny

5. Particles, resultatives and dative objects contribute to delimiting the event described by the verb phrase. Recall the discussion in Chapter 2 of aspectual particles and resultatives:

46  
John dried his socks. (delimited, non-delimited)  
John dried his socks out. (delimited)  
  
John ate an apple. (delimited, non-delimited)  
John ate an apple up. (delimited)  
  
John pushed the cart. (non-delimited)

John pushed the cart over. (delimited)

John scrubbed the floor. (delimited, non-delimited)  
 John scrubbed the floor clean. (delimited)

John pressed the pages. (delimited, non-delimited)  
 John pressed the pages flat. (delimited)

This is not quite as obvious for dative arguments of double object constructions, but it can be demonstrated. Culicover (1982) observed that 'for' datives which are ambiguous between a benefactive and a recipient reading (47a) are only interpretable as recipients when expressed in the double object construction (47b). (Examples 47 and 48 are from Carrier-Duncan and Randall (1987), p 43-44.)

47

- a. Max baked a cake for Felicia.  
 William wrote a sonnet for Felicia.  
 Alphonse knitted that nosewarmer for Felicia.
- b. Max baked Felicia a cake.  
 William wrote Felicia a sonnet.  
 Alphonse knitted Felicia that nosewarmer.

Furthermore, they show that benefactive 'for' datives may not appear in the double object position:

48

Jeeves drove that car for Madame.  
 The butler swept a room for the chambermaid.  
 Jack ate some spinach for his mother.

- \*Jeeves drove Madame that car.  
 \*The butler swept the chambermaid a room.  
 \*Jack ate his mother some spinach.

A recipient argument differs from a benefactive argument in the way it is understood to participate in a linguistically

described event. In the benefactive reading of 'Max baked a cake for Felicia', we understand that Max has Felicia in mind when he bakes the cake, but she does not necessarily receive it. The argument 'Felicia' does not contribute to delimiting the event. However, in the recipient reading, Felicia is understood to receive the cake. Felicia's receipt of the cake marks a point of time in the described event -- a point of time that delimits the event.<sup>3</sup>

The constraint that the dative object in a double object construction must delimit the event explains several of the special semantic properties associated with these objects. Many of these are noted by Green (1974). She observes that with double object constructions, the dative and accusative objects are understood to exist at the same time as each other, in some relevant sense. (Examples 49 through 51 are from Green (1974).)

-----  
3. In the author's judgement there is a possible reading of 'Max baked Felicia a cake' in which Felicia does not actually receive the cake. However, there is still a distinction between a) and b) below with regard to this benefactive-like reading:

- a. Max baked Felicia a cake.
- b. Max baked a cake for Felicia.

In a), more than in b), Max believes or intends Felicia to receive the cake. That intent supplies a standard which must be met in the baking of the cake, and contributes to delimiting the baking event.

49

- a. The American ambassador baked a cake for James I.
- b. \*The American ambassador baked James I a cake.

49a can mean the ambassador baked a cake for James I long after James I was dead and gone, so that the cake came into existence after James I had departed. The cake might have been baked in James I's honor. 49b, however, cannot mean this, and is pragmatically impossible because James I never co-existed with cakes baked by American ambassadors. 49b must be understood to mean that James I and the cake were extant at the same time (or were believed to be by the ambassador -- this is the 'relevant sense' mentioned above). Likewise with 50:

50

- a. She's going to sing a song for her late lover.
- b. \*She's going to sing her late lover a song.

50b is odd because the late lover cannot be understood to exist when the song is sung. The late lover therefore cannot be a true recipient of the song. This requirement does not hold of 50a, which is not a double object construction, so 50a is pragmatically interpretable.<sup>9</sup> Finally, 51a might be said

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9. Green (1974) mentions a double object verb, 'owe', which is at first glance aberrant in this respect. The question is, does the expression,

owe Bill forty dollars

describe an event measured out by forty dollars and delimited by Bill? Forty dollars is measurable on a scale (even though that scale is not necessarily 'spread out' over time) because

by someone who did not believe in Santa Claus, but 51b would not:

51

- a. Did you really write a thank-you note to Santa Claus?
- b. Did you really write Santa Claus a thank-you note?

The semantic requirements on the dative object in a double object construction --- that it must be understood to exist, to be a recipient, and to coexist with the accusative object -- can be subsumed under the single requirement that the dative object delimits the event. We see that a necessary (though not sufficient) condition for double object constructions is that the dative argument contributes to delimiting the event described by the verb.

There is another important semantic requirement on dative objects of double object constructions. They must be animate or sentient:

52

- a. send a telegram to Bill
- b. send Bill a telegram

53

- a. send a telegram to Tokyo
- b. \*send Tokyo a telegram

-----  
it is possible to owe Bill \$37, \$38, or \$39 dollars. Bill does delimit the event (in a relevant sense) if he is understood to be a hypothetical recipient of a \$40 which is to change hands. Viewed in this way, 'owe' is similar to other double object verbs of this class identified by Green: 'bequeath', 'leave', 'offer', 'allot'. This is an illustration of how verb meanings are constructed around a core meaning, within a certain range of variation.

53b is considered impossible by most speakers, because the dative object is inanimate. There is an acceptable reading for 53b, however, in which 'Tokyo' represents someone or something that is cognizant of the arrival of the telegram -- a bureaucrat in an embassy or government office, perhaps. The requisite property is not animacy per se, but the ability to undergo a change of state that delimits the event, while being a bystander or indirect participant in the event. The fact that this ability is naturally associated with emotional or mental states explains why these objects are usually animate, but this fact is not a linguistic fact. The view I am advocating is that only the aspectual requirements on the way the dative object participates in the event are linguistic facts.

6. The postverbal NP's or accusative objects associated with particles, resultatives and dative objects are capable of measuring out and possibly delimiting the event described by the verb. In this way they act like canonical direct arguments. As we have seen, with particles the postverbal NP may receive a totally affected interpretation in the absence of a particle. The particle merely serves to disambiguate the sentence:

- 54  
a. eat an apple (delimited, non-delimited)  
b. eat an apple up (delimited)

In the delimited reading of 54a above it is the boundaries of

the accusative object, apple, that provide the boundary of the event as described by the verb. The same discussion applies to resultatives. A totally affected interpretation of the accusative object is possible in the absence of the resultative:

55

- a. water the tulips
- b. water the tulips flat

- a. scrub the floor
- b. scrub the floor clean

In the totally affected or delimited readings of the examples above the action is understood to progress through the object argument in the course of the event, until it has applied to the entirety of it.<sup>10</sup>

The accusative argument in double object constructions either delimits the event, or provides the scale on which it may be delimited. In this way the accusative argument has the canonical semantic/aspectual properties of a direct argument.

-----

10. Even when, in the normal use of the verb, the accusative object does not delimit the event, it does do so when there is a resultative. For example, a sign advertising lead-free gas in White River Junction, NH, says:

Drive your engine clean.

Although 'engine' in 'drive your engine' is unaffected, so that the sentence describes a non-delimited event, with the resultative 'clean' the engine is understood to be affected and to measure out the event. Some change in the engine registers the end of this event.

The verbs in 56 are double object verbs, but they may also appear with only an accusative object. When they do, the verb phrases express delimited events:

56  
sell (Jim) a car  
award (Jim) a prize  
tell (Jim) a story  
wire (Jim) the news  
knit (Jim) a sweater

The events of selling a car or awarding a prize are delimited by a change of state of the direct arguments, the car and the prize. (The change of state is a change in ownership.) The events of telling a story, wiring the news, and knitting a sweater are delimited by the event's progression through the spatial or temporal extension of the story, the news, or the sweater.

The verbs in 57, also double object verbs that are grammatical with a sole accusative argument, have accusative arguments that measure out the event through their change of location:

57  
Push (me) the wheelbarrow.  
Lower (me) the rope.

The events of pushing the wheelbarrow and lowering the rope are non-delimited events. However, they become delimited events when there is a recipient (dative object) that marks the end of the change in location of the moving object

(accusative object).

Some double object verbs allow an ambiguity between a reading in which the accusative object delimits the event, and one in which the accusative object measures out the event but the event is delimited by the dative object:

58

- a. mail Charles a letter
- b. throw Charles a ball

58a describes a delimited event, but the event is ambiguously delimited. The event may end when the letter has been taken to the post office, stamped, and dropped into the mailbox on its way to Charles. Or it may end when Charles actually receives the letter. The first interpretation is selected by 59a, the second by 59b:

59

- a. It took two hours to mail Charles a letter at the post office.
- b. It took two weeks to mail Charles a letter in Alaska.

The same thing is true of 58b. One ball-throwing event (one throw of one ball) is a delimited event, but it may be delimited in two ways. The event may be understood to include everything up to the launching of the ball from the thrower's hand: winding up the pitching arm, building up momentum, releasing the ball. Or it may be understood to include the progress of the ball until it achieves some distance or arrives at some place. The first reading is emphasized in 60a, and the second is emphasized in 60b:

60

- a. throw the ball with a jerky motion
- b. throw the ball seven miles

Although the verb phrases in 58 describe ambiguously delimited events, they must be interpreted, on any one reading, as delimited in only one way:

61

\*mail Charles a letter in two hours in two weeks

- ??throw Charles the ball with a jerky motion seven miles  
??throw Charles the ball seven miles with a jerky motion

This is consistent with the aspectual principle of argument structure advanced in Chapter 4, that states there may only be one 'delimiting' associated with one verb phrase.

The following generalizations about constructions involving particles, resultatives and datives of double object constructions have been stated in 1 through 6:

- 1) These constructions all require a postverbal NP or accusative object.
- 2) Particles, resultatives and dative objects may occur on either side of the postverbal NP or accusative object.
- 3) Particles, resultatives and dative objects must be unique in the verb phrase.
- 4) Particles, resultatives and dative objects are more tightly thematically related to the verb than to the postverbal NP or accusative object.
- 5) Particles, resultatives and dative objects delimit the event described by the verb phrase.
- 6) The postverbal NP or accusative object measures out (and

may delimit) the event in the canonical fashion of direct arguments.

The first point to be made concerning these generalizations is a reiteration of the central point of Chapter 2. These constructions having similar aspectual properties also have similar syntactic behaviors. Aspectual properties have syntactic reality. We may go even further than this by incorporating the aspectual principles of argument structure advanced in Chapter 4 into the discussion. The aspectual properties of these constructions actually explain some of these syntactic behaviors.

First, the facts in 1 and 3 are not surprising in view of the facts in 5 and 6. These show that the postverbal NP or accusative object plays the canonical direct argument role of providing the scale on which the event is measured out; and the particle, resultative or dative object delimits the event on that scale. The particle, resultative or dative object (the delimiting element) requires the scale provided by the postverbal NP or accusative object (the direct argument) in order to delimit the event. These elements cannot delimit the event independently of that scale, and therefore a sentence containing only a delimiting element and not a direct argument is uninterpretable. This results in generalization (1). Generalization 3 is explained by the aspectual constraint on argument structure that requires that there be no more than one 'delimiting' associated with a verb phrase. A verb phrase

with more than one particle, resultative or dative object would have more than one 'delimiting'.

Viewed in light of the aspectual principles of argument structure, generalizations 1, 3, 5 and 6 fit together into a coherent, integrated picture of the argument structures of these three constructions. Generalizations 1 and 3 are not surprising from the point of view of the syntax of double object constructions, because we expect arguments to be unique and obligatory. But the syntax of particle and resultative constructions provides less reason to expect these generalizations to hold, since these elements are not generally thought of as arguments. With the aspectual theory of argument structure, 1 and 3 are natural corollaries of the aspectual properties of particles and resultatives; and particles and resultatives are unified with double object constructions in a simple way.

I have not provided an aspectual perspective on generalization 2 -- the fact that the delimiting element occurs on either side of the accusative object. This generalization is at the root of one of the central questions about double object constructions: how are they related to prepositional dative constructions? There is a large body of literature addressing this question from the syntactic point of view, and many syntactic issues bear upon it which I shall not go into due to limitations of time and space. However, I

think it is reasonable to expect that aspectual issues will be found to have considerable bearing on this question. A proper elucidation of the aspectual implications for 2 will have to await further research.

The syntactic and aspectual properties of particle, resultative and double object constructions underscore the relevance of aspect to syntax, argued for in Chapter 2. However, merely demonstrating the fact that there is a connection between aspectual properties and syntax does not make aspect a useful tool for syntactic research. Some minimal theory of that connection is necessary, through which productive questions may be posed. The aspectual principles of argument structure introduced in Chapter 4 do just that, by proposing an inherent correlation between the aspectual properties of an argument and its structural position. Internal and external arguments, which have distinct aspectual properties, are structurally distinguished at deep structure. Since the arguments of unaccusatives, which are deep structure objects, share the aspectual properties associated with canonical object positions (government by the verb), that correlation is proposed to hold at deep structure. This is in the spirit of regarding deep structure as the pure representation of thematic relations, and capitalizing on the connections between aspectual structure and thematic structure discussed in Chapter 4. Continuing this line of approach, the interesting question about double-object constructions for an

aspectual theory such as this is: what are the deep structure positions of the two arguments (and particularly the accusative argument) in double-object constructions? Since the accusative object or postverbal NP has the canonical aspectual properties of a direct argument, we are interested in its structural position at deep structure.<sup>11</sup>

The double object construction in 62 has five possible deep structures represented in 63:

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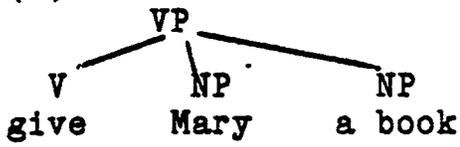
11. One important issue must be noted. I have assumed that direct argument-hood is defined at deep structure, and argued that aspectual properties associated with certain structural positions are likewise defined at deep structure. (The bulk of this argument rests on unaccusatives, which are discussed in Chapter 6.) This view will have serious consequences for analyses of double object constructions. The logical consequence of this view is that prepositional datives and datives of double object constructions must be base generated, since they differ aspectually. The Barss-Lasnik data would be difficult to account for under this view. There are some arguments in favor of defining direct argumenthood at S-structure, although for the reasons mentioned above, I do not adopt that approach here.

62

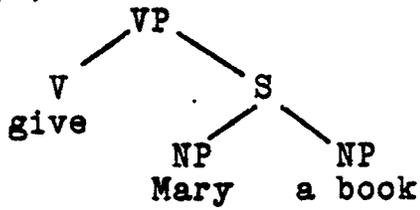
give Mary a book

63

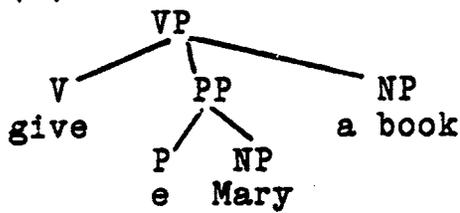
(a)



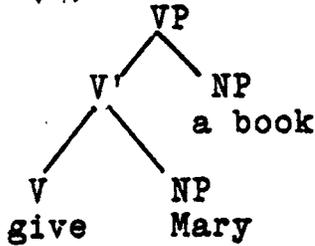
(b)



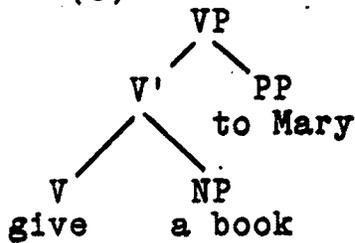
(c)



(d)



(e)



63a is the base generated structure proposed by Oerhle (1975). 63b has been proposed by Kayne (1983). In 63b, the two arguments form a constituent in a small clause structure. This has certain syntactic consequences exploited by Kayne involving the government of traces in double-object constructions, and the substitution of an 'unambiguous paths' condition for the conventional statement of c-command. (For details see Kayne (1983).) In an earlier paper Kayne (1981) proposed a structure like 63c, in which an empty preposition precedes the dative object. Kayne derives certain differences between French and English dative constructions by this means. In 63d, the verb and the dative object form a constituent at deep structure. This deep structure constituency has been proposed in some form by a number of authors, including Fillmore (1965), Chomsky (1975), Bach (1979), Larson (1987), Jacobson (forthcoming).<sup>12</sup> 63e was assumed or argued by Emonds (1976) to be the base generated form from which the double object construction was derived by transformation.

Note that NP-movement (or transformations in the older view)

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12. There is variation among these authors as to whether they include the preposition in the deep structure. The important thing here is that they all support the idea that the verb and its dative object is a more basic constituent at deep structure than the verb and its accusative object.

need not apply to 63a through 63d to derive the surface word order. However, certain binding facts noted by Barss and Lasnik (1986) seem to indicate that the accusative object is in the binding domain of the dative object, while the converse is not true. Some kind of movement would have to apply to 63a through 63d if the c-command relations indicated by these binding facts were to be derived at surface structure.

(Larson (1987) proposes one possible means of accomplishing this, involving verb raising and NP-movement.) Some kind of movement would also be necessary to derive the surface word order in a double object construction from a deep structure such as 63e. I will not address the question of how these possible deep structures in 63 are to be related to the surface structure of a double object construction, although a plausible account of this would be necessary in order to firmly adopt one of these structures. I restrict myself to considering whether there is any aspectual evidence for any of these deep structure constructions.

Assuming a correlation between deep structure position and aspectual properties, the accusative object must be structurally distinguished because it is aspectually distinguished. It has the canonical aspectual properties of a direct argument. This should rule out 63a and 63b, in which there is no structural asymmetry between the accusative and dative objects. In 63a, there is an asymmetry between the objects insofar as the dative object is adjacent to the verb,

while the accusative object is not; but this distinguishes the wrong argument, since it is the accusative NP that we expect to be structurally distinguished.

We are left with a choice between 63c, 63d, and 63e. Recall generalization 4:

Particles, resultatives and dative objects are more tightly thematically related to the verb than to the postverbal NP or accusative object.

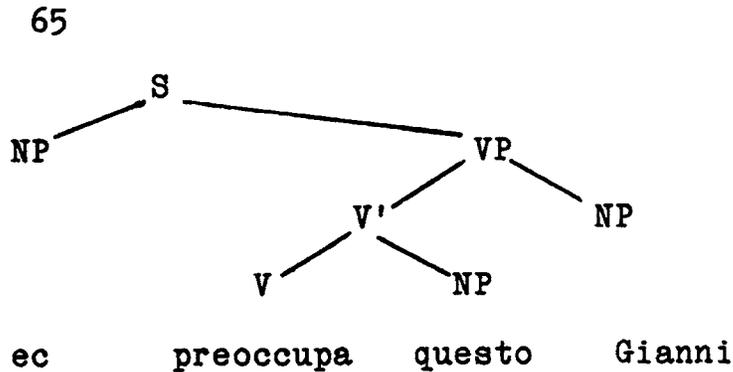
This fact would seem to indicate that the verb and the dative object form a constituent at deep structure. If deep structure positions reflect thematic structure, then we should expect the verb and the dative argument to be sisters at deep structure. This provides some independent reason for selecting 63d as the deep structure of double object constructions. If this is true, then the canonical structural position for direct arguments is not necessarily sister to the verb, but highest NP object dominated by the VP node. There is some support for this from aspectual considerations. A deep structure proposed by Belletti and Rizzi (1986) for certain psych verbs in Italian has both of the verb's arguments under the VP, with the argument having the aspectual properties of a direct argument occupying the higher position of the two:

Belletti and Rizzi propose that sentences such as,

64

Questo preoccupa Gianni.  
"This worries Gianni."

have underlying structures like the following:



For reasons that will be discussed in greater depth in section 6.5, the experiencer argument-`Gianni' measures out and delimits the event, whereas `questo' does not do so. The experiencer must therefore be the direct argument in sentences such as these. Belletti and Rizzi propose a generalization in the form of a thematic hierarchy, that experiencer arguments like `Gianni' must be `higher' in the phrase structure than arguments like `questo'.<sup>13</sup> As a thematic hierarchy, this is merely a stipulation, but as part of a larger generalization including dative objects of double object constructions, it is evidence for the following:

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13. Belletti and Rizzi refer to `questo' here as a theme, but since I do not believe that is an appropriate name for the thematic role of this argument, I leave it un-named.

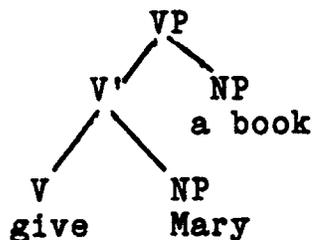
66

The direct or internal argument, the argument that is capable of measuring out and delimiting the event, is the highest NP object under the VP node.

66 is proposed as a hypothesis for future research.<sup>14</sup>

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14. The argument structure selected above also allows us to speculate about the special semantic properties of datives of double object constructions. Recall that they are usually animate, because they must delimit the event without being acted upon directly. In this structure the dative object is sister to the verb:



It may be that the position as sister to the verb requires the dative object to be understood as undergoing a change of state (and thus delimiting the event); but since the role of true direct argument is taken by the higher accusative argument, only the accusative and not the dative can 'measure out' the event. The dative argument is in a position where it must delimit but may not measure out the event by being acted upon directly. It would seem that this hybrid object-like aspectual position is accompanied by hybrid object-like aspectual properties. I leave this as a promising line for further investigation.

Chapter 6. Aspect and the Mapping of Cognitive Structure  
into Syntax

6.1 Introduction. The Aspectual Interface Hypothesis

The nature of the interface between semantics and syntax is a central problem in linguistics, and has been the source of lively discussion and disagreement among linguists working in this area. Of particular importance and currency is the nature of the interface between syntax and what has been variously called cognitive, thematic, or lexical semantic structure -- loosely speaking, the 'meaning' of words. I will refer to it here by the relatively neutral term of 'cognitive structure'. What I mean by cognitive structure is the representation of the 'meanings' of words in some appropriate system that captures a native speaker's knowledge of the lexical semantics of his or her language. The relationship between syntax and cognitive structure has been widely discussed in the literature, but there is disagreement about whether they must constitute separate levels of representation in a model of natural language; or if so, whether only two levels are adequate instead of three or more. Some authors maintain that cognitive structure translates directly into syntax.<sup>1</sup> Under this view the lexical 'meaning' of predicates

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1. Fillmore (1968) adopts this view. This is also the approach taken by generative semantics. See Lakoff (1971), McCawley (1971) and Postal (1969).

entirely determines the manifestation of predicates and their arguments in syntactic structures. Others hold the view that the two levels are not reducible to one, and there is a mapping between these levels that is, if not entirely arbitrary, governed at least partly by thematic hierarchies or linking rules.<sup>2</sup> These are rules that predict how various thematic roles,<sup>3</sup> such as agent, theme or goal, will map into external, internal or oblique argument positions in the syntax. I will adopt the second view, which holds that cognitive and syntactic structures must be fundamentally distinct, and the cognitive representation of a predicate (its 'meaning') does not absolutely determine how its arguments will be arranged in the syntax. I will not argue for this view here.

Notwithstanding the separateness of syntactic and cognitive structure, there is undeniably enough correlation between 'meaning' and syntactic structure to call for some explanation of the connection between the two levels of representation. Thematic hierarchies and linking rules provide a mechanical description of the correlation, but rules such as these do little to explain why, for instance, an agent is always found

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2. Gruber (1965), Jackendoff (1972), Kiparsky (1985), Hale and Keyser (1986, 1987) take this view.

3. Although I believe thematic roles are an inadequate means of expressing the cognitive structure of a predicate, I will use them as a convenient shorthand for the time being.

in an external argument position and a theme always becomes the direct argument of a predicate. I will argue in this chapter that the aspectual properties associated with external, internal and oblique arguments outlined in Chapter 4 are sufficient to account for the apparent correlation between syntactic argument structure and cognitive structure. I will take the strongest view and state it in the strongest way -- that these aspectual properties of syntactic argument structure are all that needs to be said of the mapping from cognitive structure into syntax.<sup>4</sup> Chapter 3 has shown that affectedness, a semantic or cognitive property with syntactic consequences, is actually an aspectual property; and Chapter 5 has demonstrated that the syntax of particles, resultatives, and double object constructions is in part explained by the aspectual properties of these constructions. These ideas carried to their logical extreme suggests the following hypothesis:

Aspectual Interface Hypothesis (AIH)

The mapping between cognitive structure and syntactic argument structure is governed by aspectual properties. Only the aspectual part of cognitive structure is visible to the syntax.

This means that of the variety of information contained in a thematic role such as agent, patient, actor, goal, etc., only

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4. Although I refer to a mapping from cognitive structure into syntax I do not mean to imply any necessary directionality in the mapping.

the aspectual information is relevant to syntax. The prediction is made, that thematic hierarchies instrumental in the mapping between thematic or cognitive structure and syntax depend on aspectual properties.<sup>5</sup> Furthermore, the AIH may provide the basis of some theoretical underpinnings for statements such as the Universal Theta Assignment Hypothesis, formulated by Baker (1985) in the framework of Government and Binding; and the Universal Alignment Hypothesis, formulated by Perlmutter and Postal (1984) in the framework of Relational Grammar.

#### Universal Theta Assignment Hypothesis (UTAH)

Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure.

#### Universal Alignment Hypothesis (UAH)

There exist principles of universal grammar which predict the initial relation borne by each nominal in a given clause from the meaning of the clause.

The UTAH and the UAH propose a strict correlation between 'meaning' and structure. The aspectual constraints on argument structure suggest a mechanism by which such a correlation may be mediated.

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5. The Aspectual Interface Hypothesis does not say that all semantic relations, processes or operations in syntax depend on aspectual properties. Predication, modification, complementation, quantification, etc. do not; except insofar as they interact with aspectual constraints on argument structure.

A thorough and definitive demonstration of the validity of the Aspectual Interface Hypothesis is beyond the scope of this thesis. In this chapter I will merely attempt to demonstrate its plausibility. The AIH will stand as a directive for future research.

I will not develop or argue for any particular view of or mode of representation of cognitive structure. A variety of systems are in the literature, including: Gruber's system of pre-lexical categorial structures (Gruber (1965)); Jackendoff's functional structures based on primitive semantic functions (Jackendoff (1972)); Dowty's system of lexical decomposition of verbs (Dowty (1979), and see Appendix to Chapter 1);<sup>6</sup> systems based on thematic roles, such as employed in Chomsky (1981) and elsewhere; and Hale and Keyser's Lexical Conceptual Structure (Hale and Keyser, (1986, 1987)). Each of these may be partly on the right track. I assume that some sort of representation of cognitive structure is needed, but I will only compare these options, or speculate on what sort of representation is the correct one, insofar as the aspectual correlates of syntactic structure place demands on this representation.

Four principles of argument structure have been advanced in

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6. Talmy also explores the possibilities of lexical decomposition. See Talmy (1985).

## Chapter 4:

(i) If an internal direct argument undergoes change during the event described, that change is characterizable as a change in a single parameter or change on a scale.

(ii) Events are described linguistically as delimited through the scale provided by the direct argument, and they are delimited within the verb phrase; i.e., an event may be linguistically delimited by an internal direct or indirect argument, but not by an external argument.

(iii) There may be at most one 'delimiting' associated with a verb phrase.

(iv) Secondary arguments are delimiting expressions.

Now we examine how far these properties go in explaining why certain arguments of verbs with particular cognitive structures appear in the syntax as internal, external or oblique arguments. In the next section it will be demonstrated that principles (i) and (ii) above explain the mapping of verbs into the unaccusative and unergative verb classes.

### 6.2 Unaccusative and unergative verbs

#### 6.2.1 Introduction

Intransitive verbs may be divided into two classes: the

unergatives and the unaccusatives.<sup>7</sup> The sole argument of an unaccusative verb is an internal argument, while the sole argument of an unergative verb is an external argument.<sup>8</sup> Unaccusative and unergative verbs provide a testing ground for theories of internal and external arguments, because they are, in a sense, minimal pairs. Comparison of these two verb classes, therefore, is a promising place to begin investigating the nature of internal and external arguments. The distinction is a syntactic one; internal and external arguments have different syntactic representations. A variety of syntactic distinctions, showing that unaccusative and unergative verbs have different syntactic behaviors, have been mustered in a number of languages. The two verb classes also show a striking semantic coherence cross-linguistically, but in general the diagnostics in the literature for membership in these classes, have been syntactic diagnostics.

First I will review the syntactic arguments for the internal or external argument-hood of the arguments associated with unaccusative and unergative verbs. Next I will show that none

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7. Unaccusative verbs have also been called ergative verbs. I will avoid a confusing proliferation of terminology by referring to them in this thesis simply as unaccusatives. I use the term 'intransitive' to mean a verb with only one argument.

8. Burzio (1986), who introduced the unaccusative/unergative distinction into Government and Binding theory, defines unaccusatives as verbs that take a 'direct object' but assign no thematic role to the subject.

of the semantic factors that seem to correlate with internal or external argument-hood have perfect predictive power. Finally I will show that the arguments of unaccusatives and unergatives may be distinguished aspectually in that the arguments of unaccusative verbs measure out the event in a way that the arguments of unergatives do not. The arguments of unaccusatives are therefore undifferentiated with respect to the event described by the verb, and the arguments of unergatives are not. (What is meant by 'undifferentiated' will become clearer in the following section.)

The aspectual theory of internal and external arguments predicts three cross-linguistic classes, with respect to 'meaning' or cognitive structure, of intransitive verbs: those verbs that are always unergative, those that are always unaccusative, and those that do not map consistently to one or the other class. These classes depend on whether the cognitive structure of the verb is compatible or incompatible with the aspectual properties of internal arguments. This prediction will be borne out. The existence of this third class shows that cognitive and syntactic structure must be distinct levels of representation, because languages do make some arbitrary choices in the mapping of cognitive structure into syntax.

6.2.2 Review of the syntactic approach to unaccusatives and unergatives

The class of unaccusative verbs was first identified by Perlmutter (1978), who described their properties within the framework of Relational Grammar. The idea of unaccusativity was later introduced into the Government and Binding framework in Burzio (1986). In both frameworks, the syntactic differences between unaccusatives and unergatives follow from the proposal that the argument of an unergative verb is underlyingly a subject; whereas the argument of an unaccusative verb is underlyingly a direct object, even though it appears on the surface as a subject. In both theories, subject- and object-hood are syntactically (rather than semantically) defined, and they are used as notions with cross-linguistic applicability.<sup>9</sup> Both the Relational Grammar and Government and Binding frameworks rely on multiple levels of representation. It is these features that the two frameworks employ in representing the difference between sentences with unaccusative and unergative verbs. Both frameworks derive the difference through universal rules of syntax relating separate levels of representation. Unaccusatives and unergatives differ as to whether what is the subject at the surface level of representation is also the subject at a deeper (or an initial) level of representation. Internal and external arguments are distinguished in this way. Although most of the discussion that follows is couched

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9. For an opposing view see Van Valin (1987)

within the framework of Government and Binding theory, for the purposes of the discussion here, either approach will suffice. What is necessary is the idea that at the initial or deep structure level of representation, unaccusatives have an object argument and unergatives have a subject argument. Since at deep structure the internal argument of a verb maps to the object position and the external argument to the subject position, unaccusatives have an internal argument, and unergatives have an external argument.

The languages in which unergatives and unaccusatives are easy to distinguish syntactically include Italian, English, German, Albanian, Choctaw, Dutch, Lakhota, Turkish, Japanese, Hebrew, and Basque.<sup>10</sup> Much of the syntactic evidence for the existence of the two classes is based on showing that the arguments of unaccusatives (and the objects of transitive verbs) pattern with the moved arguments of passives, and the arguments of unergatives pattern with the unmoved subjects of transitives. Evidence from Italian and English is discussed in the following paragraphs.

Burzio (1986) provides several syntactic arguments for a Deep Structure representation of unaccusative verbs, in which

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10. See Burzio (1986) for Italian; Perlmutter (1978) for English and German; Miyagawa (1987) for Japanese. Dubinsky and Rosen (1987) is a guide to further sources in the Relational Grammar framework, on a variety of languages.

the surface subject is the underlying object of the verb. He distinguishes unergatives and unaccusatives on the basis of partitive clitics. Italian has a partitive clitic, 'ne', which may only be understood to apply to direct objects. Burzio refers to this process as 'ne cliticization', whereby the clitic 'ne' occurs in a position preceding the verb, but is associated with a direct object position following the verb. It may not be associated with any other position: (Examples 3 through 8 are from Burzio (1986))

- 3
- a. Giovanni ne inviterà molti. (direct object)  
 Giovanni of-them will invite many  
 "Giovanni will invite many of them."
  - b. \*Giovanni ne parlerà a due. (indirect object)  
 Giovanni of-them will talk to two  
 "Giovanni will talk to two of them."
  - c. \*Molti ne arriveranno. (subject)  
 many of-them arrive  
 "Many of them will arrive."
  - d. \*Molti ne telefoneranno. (subject)  
 many of-them telephone  
 "Many of them will telephone."

3 shows that the process of 'ne' cliticization can be used as a diagnostic for direct objects. Italian also has subject inversion, in which the subject appears after the verb. 'Ne-cliticization' may occur in this construction with only three types of clauses. It may occur with passives:

- 4
- a. Saranno invitati molti esperti.  
 will be invited many experts

"Many experts will be invited."

- b. Ne saranno invitati molti.  
of-them will be invited many  
"Many of them will be invited."

'Ne-cliticization' may also occur in the "inverted-subject" form of the impersonal 'si' construction. This construction is illustrated in 5a below, where the plural agreement on the verb indicates that the subject is the noun phrase 'alcuni articoli' following the verb. 5b shows that the 'ne' may be construed with these "inverted subjects".

5

- a. Si leggeranno volentieri alcuni articoli.  
one will read(pl.) willingly a few articles  
"A few articles will be read eagerly."  
b. Si ne leggeranno alcuni.  
one of-them will read(pl.) a few  
"A few of them will be read."

The third environment where 'ne-cliticization' may occur is in clauses with a particular class of verbs. These are the unaccusatives:

6

- a. affondarono due navi  
sank two ships  
"Two ships sank."  
b. Ne affondarono due.  
of-them sank two  
"Two of them sank."

The subjects in the passive (4) and the impersonal `si' constructions (5) are generally assumed to be objects at Deep Structure. I will not reproduce the arguments for this view here. The crucial point to be made is that clauses with unaccusatives are united with other constructions in which surface subjects are deep structure objects. Burzio proposes that the post-verbal subjects in 4 through 6 have not been moved from their deep structure position, and this is the cause of the syntactic difference that `ne-cliticization' is sensitive to. `Ne-cliticization' is impossible with unergatives (7) and transitives (8):

7

- a. Telefoneranno molti esperti  
will telephone many experts  
"Many experts will telephone."
- b. \*Ne telefoneranno molti.  
of-them will telephone many  
"Many of them will telephone."

8

- a. Esamineranno il caso molti esperti  
will examine the case many experts  
"Many experts will examine the case."
- b. \*Ne examineranno il caso molti  
of-them will examine the case many  
"Many of them will examine the case."

The analysis of postverbal unergative subjects as having undergone movement, and unaccusative subjects as unmoved, provides a syntactic, structural distinction between the two clause types. Whether `ne' is base generated in its surface position or moved there by derivation from Deep Structure,

(and Burzio writes that the arguments for either view are not conclusive) the process of 'ne-cliticization' responds to that syntactic distinction.

Perlmutter and Postal (1984) show that English pseudopassives distinguish between unaccusatives and unergatives. Pseudopassives are formed by moving what seems to be an oblique argument of the verb into subject position. The unergatives below form grammatical pseudopassives. (Examples in 9 and 10 are from Perlmutter and Postal (1984).)

9

- a. The bed was slept in by the Shah.  
(derived from "The Shah slept in this bed.")
- b. The package was stepped on by a camel.  
(derived from "A camel stepped on this package.")

The unaccusatives in 10 do not form pseudopassives:

10

- a. \*The package was accumulated on by dust.  
(derived from "Dust accumulated on this package.")
- b. \*The oven was melted in by the ice cube.  
(derived from "The ice cube melted in the oven.")

A law of Relational Grammar (The 1-advancement Exclusiveness Law)<sup>12</sup> prohibits two advancements (movements, in Government and Binding terminology) in one clause, from a non-subject

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12. See Perlmutter and Postal (1984) for details. Also see Marantz (1984) and Baker, Johnson, and Roberts (1986) for an alternative account.

position to a subject position. The unaccusative pseudopassives in 10 above are ungrammatical precisely because they violate this law. Since the surface subject of an unaccusative has already advanced from object position, a second advancement of an oblique object is impossible. Unaccusatives and pseudopassives are united under this analysis in having surface subjects that are moved there from some other position.

Italian and English are two languages that provide evidence for the unification of arguments moved by syntactic passivization with arguments of unaccusative verbs. I will adopt the syntactic theory of the distinction between unergative and unaccusative verbs, on the basis of the kinds of evidence cited above for Italian and English. In the next section the semantic differences between unergatives and unaccusatives will be considered.

### 6.2.3 Semantic differences between unergatives and unaccusatives

When we consider the kinds of intransitive verbs that fall into the unaccusative and unergative classes, the semantic coherence within the two classes, and the semantic differences between them, are impressive. However, no semantic diagnostic has been proposed that is not merely a strong generalization. In this section I will illustrate the fact that each semantic generalization about unaccusative and unergative verbs fails

as an absolute predictor of membership in one or the other of these two verb classes (although some are more accurate than others). A list, compiled by Perlmutter (1984), of the verbs that generally belong in each class is repeated below in its entirety. The verbs are English verbs, but Perlmutter maintains that verbs of similar meaning make up the two classes cross-linguistically.

### Predicates Determining Initially Unergative Clauses<sup>13</sup>

11

- a. Predicates describing willed or volitional acts:  
work, play, speak, talk, smile, grin, frown, grimace, think, meditate, cogitate, daydream, skate, ski, swim, hunt, bicycle, walk, skip (voluntarily), jog, quarrel, fight, wrestle, box, agree, disagree, knock, bang, hammer, pray, weep, cry, kneel, bow, curtsey, genuflect, cheat, lie (tell a falsehood), study, whistle (voluntary), laugh, dance, crawl, walk, etc.

Manner-of-speaking verbs:

whisper, shout, mumble, grumble, growl, bellow, etc.

Predicates describing sounds made by animals:

bark, neigh, whinny, quack, roar (voluntary), chirp, oink, meow, etc.

- b. Certain involuntary bodily processes:  
cough, sneeze, hiccough, belch, burp, vomit, defecate, urinate, sleep, cry, breathe, etc.

12

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13. The term 'initially' in this heading refers to the idea that the distinction between the two classes is stated at the initial stratum (deep structure), and is lost when the unaccusative argument changes from an object to a subject. Also, in the Relational Grammar framework it is possible to refer to unaccusativity and unergativity at various levels of representation.

## Predicates Determining Initially Unaccusative Clauses<sup>14</sup>

- a. Predicates expressed by adjectives in English:  
a very large class, including predicates describing sizes, shapes, weights, colors, smells, states of mind, etc.
- b. Predicates whose initial nuclear term<sup>15</sup> is semantically a Patient  
burn, fall, drop, sink, float, slide, slip, glide, soar, flow, ooze, seep, trickle, drip, gush, hang, dangle, sway, wave, tremble, shake, languish, flourish, thrive, drown, stumble, trip, roll, succumb, dry, blow away, boil, seethe, lie (involuntary), sit (involuntary), bend (involuntary), etc.  
  
inchoatives:  
melt, freeze, evaporate, vaporize, solidify, crystallize, dim, brighten, redden, darken, yellow, rot, decompose, germinate, sprout, bud, wilt, wither, increase, decrease, reduce, grow, collapse, dissolve, disintegrate, die, perish, choke, suffocate, blush, open, close, break, shatter, crumble, crack, split, burst, explode, burn up, burn down, dry up, dry-out, scatter, disperse, fill, vanish, disappear, etc.
- c. Predicates of existing or happening:  
exist, happen, transpire, occur, take place, and various inchoatives such as arise, ensue, result, show up, end up, turn up, pop up, vanish, disappear, etc.
- d. Involuntary emission of stimuli that impinge on the senses (light, noise, smell, etc.):  
shine, sparkle, glitter, glisten, glow, jingle, clink, clang, snap (involuntary), crackle, pop, smell, stink, etc.
- e. Aspectual predicates:  
begin, start, stop, cease, continue, end, etc.

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14. It should be noted that there is not universal agreement on this classification. According to B. Levin (p.c.) and Zaenen (1986), verbs of involuntary emission of stimulus such as those in d (and also 'blush', which is similar to these but is listed under b (B. Levin, p.c.)) are not unaccusatives.

15. 'Initial nuclear term' here refers to the argument of the intransitive form of the verb.

- f. Duratives:  
last, remain, stay, survive, etc.

Many semantic generalizations are statable over the two classes. These have been widely noted in the literature, and certain semantic properties have been ascribed to one or the other of the classes. Among these are:

(i) agency. By agency is meant physical causation. That is, the argument does something or moves in some way, voluntarily or involuntarily, to cause the action to take place. This seems to be a property of unergative verbs. Some unspecified 'sub-actions' must take place for the action described by the verb to occur. 'Skating', 'walking' or 'bicycling' involves moving the legs in a particular way. 'Wrestling' entails doing particular things with the arms. 'Whispering' or 'barking' requires activating the mouth and vocal tract. In order to 'hammer' one must hold the hammer, as well as wield it. Various parts of the anatomy do various things when someone 'sneezes' or 'belches'. Even 'meditating' or 'cogitating' require a kind of initial action, in a metaphorical sense, to set the mind in place and launch it on a particular kind of mental activity.

Unaccusatives generally do not have this property. No other action is necessary on the part of the argument besides that specifically denoted by the verb. If something 'evaporates', or 'melts', or 'reddens', or 'scatters', or 'disappears', or

`remains'; it does not have to do anything else but that. An event of `reddening' or `disappearing' can take place without any other noticeable events or changes transpiring.

Agency in this sense, then, is an attractive possibility for a semantic distinction between the two classes. However, its coverage is not perfect. The unergative verbs `smile' and `grimace' can be argued not to entail other actions on the part of the smiler or grimacer (e.g., such as putting one's hands to one's face to rearrange the facial muscles). The unaccusative verb `stumble' does seem to involve independent motions of the legs or feet. The point to be made here is that agency in the sense of physical causation does not yield an absolute distinction between the two classes.

(i) volition or protagonist control. These properties refer to agency in the sense that the argument wills the action denoted by the verb. All of the unergative verbs in 11a have this property, and none of the unaccusative verbs in 12a, b, c, d, and f have it (although it is true that some of the unaccusatives have unergative counterparts involving volition). However, volition will not distinguish absolutely between the two classes. The unergative verbs in 11b such as `sneeze' or `hiccough' are not volitional, and some of the events denoted by the unaccusatives in 12e (e.g. `start' and `stop') can be willed. Neither physical causation nor volition can be exclusively associated with one or the other

class.

(iii) animacy. This is a property commonly associated with agency, and always associated with volition (depending on one's metaphysical view of the world). Most if not all of the unergatives in 11 can only have animate arguments, and most of the unaccusatives in 12 take only inanimate arguments. But again, this is only an imperfect generalization; there is an unaccusative verb 'die' that requires an animate argument.

(iv) inherent lexical aspect: duration. All the unergatives in 11 express situations with some duration over time (accomplishments or activities in Vendler's terminology). A large subgroup of the unaccusatives in 12, the inchoatives, express situations that happen almost instantaneously. But the unaccusatives also include many verbs like 'burn', 'drip' and 'shake', which express events that happen over some interval of time. Duration is not an accurate diagnostic for unaccusativity and unergativity.

(v) inherent lexical aspect: delimitedness. Unergatives tend to describe non-delimited events, while unaccusatives tend to describe delimited events. This is true of the unergatives 'work', 'smile', 'walk', 'mumble', and 'sleep'; and the unaccusatives 'melt', 'collapse', and 'vanish'. Many intransitive verbs that take affected arguments (arguments capable of delimiting events) belong in the class of unaccusatives. 12b lists a number of them. But delimitedness

is no better a diagnostic than agency, volition, animacy or duration, because there are exceptions to this generalization. The unergatives 'cough', 'sneeze' and 'bang' make delimited clauses if they are understood in the sense of coughing, sneezing, or banging once. The unaccusative list (12) includes many stative verbs, which always describe non-delimited events.<sup>16</sup>

Cross-linguistically these semantic properties are inconsistent diagnostics of unergativity and unaccusativity. According to Van Valin (1987b), in Italian and Georgian the split between unergatives and unaccusatives depends on lexical aspect, while in Acehnese and Tsova-tush it depends on agentivity.<sup>17</sup> Van Valin argues effectively that such lexical

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16. Within a stricter view of membership in the unaccusative and unergative verb classes, it may in fact be true that unaccusatives always describe delimited events: If Zaenen (1986) and Levin (p.c.) are correct these stative verbs in 12 do not belong in the class of unaccusatives. Then if we remove the class of purely aspectual verbs (12e and 12f, and perhaps 'exist' in 12d as well) the remaining verbs in list 12 describe events which are delimited by the arguments of the verbs. If this is true, the class of unaccusative verbs are distinguished by an aspectual property like middles. I leave this as an open question and assume for the moment the more general view of the membership in the class of unaccusatives.

17. Italian verbs of motion are a particularly interesting example. They may shift class, depending on whether the event is delimited or not. Auxiliary selection in Italian makes reference to the distinction between unergative and unaccusative verbs. Unergative verbs take 'avere' ("have") and unaccusative verbs take 'essere' ("be"). (The data below is from Burzio (1986).)

semantic properties correlate with the unaccusative/unergative distinction. However, he proposes no consistent mapping from these properties to the two verb classes. Rosen (1984) writes that in Choctaw, protagonist control is generally irrelevant to the distinction between unergativity and unaccusativity, but there are a handful of verbs in the language for which it is relevant.

It appears that none of the semantic properties identified

- 
- a. Giovanni ha telephonato.  
"Giovanni has ('avere') telephoned."
  - b. Giovanni e arrivato.  
"Giovanni has ('essere') arrived."
  - c. L'artiglieria ha affondato due navi nemiche.  
"The artillery has ('avere') sunk two enemy ships."
  - d. Due navi nemiche sono affondate.  
"Two enemy ships have ('essere') sunk."

Some Italian verbs of motion vary between unergative or unaccusative, depending on whether or not they denote a delimited event: (The data below is from Van Valin (1987b).)

- (i)
  - a. Luisa ha corso nel parco. (non-delimited)  
Luisa has run in the park.  
"Luisa ran in the park."
  - b. Luisa e corsa a casa. (delimited)  
Luisa is run to home  
"Luisa ran home."
- (ii)
  - a. L'uccello ha volato solo per qualche minuto. (non-delimited)  
the bird has flown only for some minutes  
"The bird flew just for a few minutes."
  - b. L'uccello e volato via. (delimited)  
The bird is flown away  
"The bird flew away."

above are adequate as diagnostics for unaccusativity and unergativity.<sup>18</sup> Yet we are left with semantic generalizations striking enough to require an explanation. The explanation becomes apparent when we consider the special aspectual properties of internal arguments.

#### 6.2.4 The aspectual distinction between unaccusatives and unergatives

The difference in the aspectual properties of internal and external arguments explains the semantic coherence of the unaccusative and unergative verb classes. Recall from Chapter 4 that an internal argument that undergoes change during an event, undergoes change in such a way that it provides a scale by which the event described by the verb may be measured out. The external argument does not have to meet this condition. A crucial property of a scale is that all units are the same, and for all practical purposes indistinguishable from each other. The change undergone by the internal argument is consequently undifferentiated with respect to the event. Furthermore, all of the scale is potentially involved in the event. Consider the unaccusatives in the following sentences:

- 13
- |                           |             |
|---------------------------|-------------|
| a. The apple ripens.      | (delimited) |
| b. The leaves burn.       | (delimited) |
| c. The puddle evaporates. | (delimited) |

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18. See Rosen (1984) for additional discussion of this point.

- d. The lake sparkled. (non-delimited)
- e. The populace thrived. (non-delimited)
- f. The city existed. (non-delimited)
- g. The ruined building will remain. (non-delimited)

(The examples are in past, present and future forms to illustrate that tense does not play a role in this phenomenon. They include both delimited and non-delimited sentences.) The first three examples, 13a, b and c, are most easily (but not necessarily) understood as delimited sentences. Consider first the delimited readings. In 13a, all the apple is consumed, and the consuming of any one part of it does not differ from the consuming of the next part. Likewise with 13b and 13c. If the leaves and the puddle were to be partitioned into subparts of leaves and puddle, all of those subparts would be understood to burn or to evaporate in the course of the event. Even in the non-delimited readings of 13(a)-(c) the argument provides a scale for the event. Even if all the leaves are not burned, the event of burning progresses through the leaves over time, without distinguishing any leaf or part of a leaf from any other. The same is true of 13b and 13c. Now consider 13d, e, f, and g. They do not have delimited readings. Nevertheless, just as with 13a, b and c, the event involves all hypothetical subparts of the arguments equally. In 13d and e, the lake and the populace are an undifferentiated mass as far as sparkling and thriving are concerned. If lake and populace are partitioned into subsections, the total amount of sparkling

and thriving is the sum of the sparkling and thriving of all the subsections. The verbs in 13f and g are statives, but they follow the same pattern. If the city exists, then all the city exists, and the city is not internally differentiated with respect to existing.<sup>19</sup> If the building remains, the wall of the building `remains' in the same way as the roof does. Wall and roof do not `remain' differently.

The verbs in 13 are unaccusative, and therefore their arguments are underlyingly internal arguments. The internal arguments measure out the event or situation described by the verb. The external arguments of the unergative verbs in the examples below do not have the aspectual property of measuring out the event:

14

- a. Bill grins.
- b. The children wrestle.
- c. Mary mumbled.
- d. The passengers coughed.
- e. The lion will roar at feeding time.

In 14 the arguments are not partitionable in such a way that they measure out the event on a scale. Various hypothetical

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19. The aspectual difference between internal and external arguments was stated in Chapter 4 for arguments which undergo change during the course of the event. The idea of being undifferentiated with respect to the event is a logical extension of the idea of a scale, to a situation in which the argument does not undergo change, as in 13(d)-(g). This is an issue that requires further research.

subparts of the arguments may be involved in the action, but the subparts are involved in individual ways. When Bill grins, Mary mumbles, or the lion roars, only their mouths, faces or lungs take action -- not the rest of them. If the passengers cough, it is their throats that do the coughing. And if children are wrestling, although they may use almost all parts of their bodies, not all parts are used in the same way. Wrestling entails various kinds of actions -- grabbing, pulling, or pushing, for instance -- which means doing very particular things with arms and legs. An event can only be measured out through its argument if the participation of the argument is partitionable into similar actions; in other words, if it is characterizable as change along a single scale. This is the basis of the aspectual distinction between internal and external arguments. The distinction is clear with verbs that have both unaccusative and unergative forms. When we hear a lion roar (unergative and volitional), we know that the source of the roar is localized to one part of the lion; but when we hear a waterfall roar (unaccusative and non-volitional), we can only think of the roar as coming from all over the waterfall. The lion is internally differentiated in the event. The waterfall is not. The aspectual distinction between internal and external arguments, based on the principles of argument structure discussed in Chapter 4, provides a more effective means of characterizing the differences between the unergative and unaccusative verb.

classes, than do the properties of agency, volition, animacy, duration or delimitedness.

The aspectual properties of internal and external arguments explain why the semantic properties discussed in section 6.2.3 characterize the two classes to the extent that they do. There are certain semantic characteristics that are more naturally associated with the aspectual properties of internal arguments than others:

(i) Agency, volitionality and animacy are not generally associated with event participants which participate in the event in an undifferentiated way, or for which change is expressible along a single scale. This has been discussed above and in Chapter 4.

(ii) Many unergative verbs are inherently durative because duration tends to be associated with agency. (This has been noted by Dowty (1979), among others.) Agency and volition on the part of the subject mean that the subject must do something in order to bring about the event. This constitutes a set of unspecified actions understood to be part of the event, and these actions take time. If there is agency on the part of the subject, and particularly if the event involves physical motion, it is possible that the event described will be one that has duration. A durational activity like 'swim' involves many unspecified actions that require motion or physical change -- rotating the arms, kicking the legs,

propelling oneself forward in the water. These actions take time. Unaccusatives such as inchoatives do not involve such unspecified actions since they describe change characterizable on a scale. When the lake freezes we do not see it doing anything else in order to freeze. When an apple reddens, that is all it does -- redden. It does not need to take a brush and paint itself red, and so it could conceivably redden almost instantaneously. For this reason unaccusatives often describe non-agentive and non-durative events.

(iii) Delimitedness is more often associated with unaccusatives than with unergatives because internal arguments may measure out the event, while external arguments cannot do so. If the argument measures out the event, it may also delimit it, as do the affected arguments discussed in Chapter 3. Some unaccusative verbs have affected arguments; the events they describe are delimitable through their internal arguments.<sup>20</sup>

The preceding paragraphs (i)-(iii) have explained why semantic and aspectual properties such as agency, volition, duration and delimitedness figure so strongly in the distinction between unergative and unaccusative verbs. The

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20. Sentences with unergative verbs may describe delimited events, but when they do, the events they describe are delimited through a real or implied object, often a cognate or reflexive object.

reasons why these semantic properties correlate so strongly with unergativity and unaccusativity are also the reasons why they fail where they do, as diagnostics of class membership. Perlmutter's lists of unergative and unaccusative verbs (11 and 12) notwithstanding, the same predicates do not always turn up in the same classes cross-linguistically. Rosen (1984) cites numerous examples, among which are the following:

15	<u>Unaccusative in:</u>	<u>Unergative in:</u>
`die'	Italian	Choctaw
`sweat'	Choctaw	Italian
`bleed'	Turkish	Italian
`suffer'	Choctaw	Italian
`hungry'	Choctaw	Italian
`dream'	Eastern Pomo	Dutch, Italian, Albanian
`sparkle'	Dutch	Italian

It is significant that the predicate-meanings in 15 could be imagined to describe situations in which the argument had either aspectual role (internal or external). These predicate-meanings constitute the third group mentioned in the introduction to this chapter, which do not belong consistently to either the unergative or the unaccusative class of verbs cross-linguistically. Verbs whose `meaning' does not absolutely commit them to one aspectual class or the other will vary from language to language.

Merlan (1985) discusses the differences between 'subjectively' and 'objectively' inflecting intransitive verbs, which for practical purposes, are equivalent to unergative and unaccusative verbs respectively.<sup>21</sup> She examines this question with respect to eight languages (Dakota, Seneca, Arikara, Tunica, Eastern Pomo, Batsbi, Georgian, Mangarayi), and concludes that semantic characterizations of these two classes are possible, but are not without exceptions. Merlan found that semantically descriptive predicates (e.g., 'be wise') tend to be objectively inflecting, but exceptions are to be found in Seneca and Dakota. Most objectively inflecting intransitives seem to be associated with involuntariness, although the voluntary/involuntary distinction is inadequate for perfectly characterizing the subjective/objective inflectional distinction. Merlan writes further that verbs having to do with bodily processes and functions (e.g. 'sneeze') cannot be characterized as associating strongly with either class.<sup>22</sup>

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21. In Merlan (1985), 'subjective' inflection refers to the marking of pronominal arguments of intransitive verbs by the same inflectional forms used for subjects of transitive verbs. 'Objective' inflection refers to the marking of pronominal arguments of intransitive verbs by the inflectional forms used to mark objects of transitive verbs. In these cases the inflection on pronominal arguments marks whether it is an internal or an external argument.

22. Merlan observes that certain verbs of bodily processes tend to be found in the smaller of the two verb classes, whether they are subjectively or objectively inflecting. Furthermore, this minority verb class tends to contain verbs

Subjectively inflecting classes are likely to contain verbs of inherently directed motion (e.g., 'jump', 'fly'), while objectively inflecting classes generally contain verbs of manner of motion (e.g., 'fall', 'slip'). There is a correlation between objective inflection and verbs describing mental processes or physical or mental conditions. There is also a correlation between subjective inflection and voluntary activity. However, in spite the existence of these pronounced patterns, Merlan concludes that:

Any formulation of the relation between lexical meaning and inflection form is evidently an implicational statement and not an absolute categorization...(Merlan (1985), p. 349)

The unaccusative and unergative verb classes, determined by syntactic criteria, do not always contain the same predicate-meanings cross-linguistically. Therefore the mapping from 'meaning' to aspectual and syntactic structure cannot be governed by inviolable principles. Whether an intransitive verb takes an internal or an external argument must be marked in the lexicon, but how it is marked is influenced by the necessity of fitting the 'meaning' into an aspectual structure. The marking of a verb's argument as internal or external may be influenced by 'meaning', world knowledge or even cultural beliefs. Dying or dreaming, for example, may be viewed differently in different cultures, and

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requiring animate subjects. If this is a general tendency across languages I have no explanation for it.

the way these events are viewed may contribute to whether they are perceived to fit into the aspectual mold of an internal or external argument. Such extra-linguistic effects as these may influence whether a predicate-meaning is instantiated as an unaccusative or an unergative verb in a particular language. But once a verb is marked in the lexicon as taking an external or an internal argument, its interpretation conforms to the aspectual constraints on verbs with internal or external arguments.

Some types of verbs of motion are particularly variable. On the one hand, the moving argument does not seem to change during the event, and may engage in unspecified sub-actions to bring about the motion, so it does not 'measure out' the event. On the other hand, the property of location, which is a property of the argument, certainly 'measures out' the event. This explains why verbs of motion may go either way.

Under the view advanced here, there is no direct mapping from thematic or cognitive structure to syntactic structure; rather, the mapping is from cognitive structure to aspectual structure. The aspectual structure is inherent in the syntax. This is the reason why, while semantic properties seem to map into syntax, the precise mapping has always eluded discovery. Aspectual structures impose general constraints on the types of events in the world that may be mapped into them, in a way that purely syntactic structures cannot. In other

words, the aspectual structure provided by language -- the distinction between internal and external arguments, for instance -- is the mold into which the linguistic expression of events in the world must be fitted.

Furthermore, thematic roles such as 'agent' or 'theme' are not visible to the principles of syntax, but only to the aspectual structure inherent in the syntax. The view I am advocating supports a strong version of the autonomy of syntax and semantics; and furthermore, provides an explicit model for the interface between syntax and lexical semantics.

### 6.3 The locative alternation

Recall the class of spray/load verbs discussed in section 2.5.3. This is a class of verbs that exhibits the locative alternation (so named by Rappaport and Levin (1984)) illustrated in 16 below:

16

- a. spray paint on the wall  
spray the wall with paint
- b. load hay on the wagon  
load the wagon with hay
- c. clear dishes from the table  
clear the table of dishes
- d. cram pencils into the jar  
cram the jar with pencils

I will refer to these verbs as spray/load verbs. Verbs in this class have two arguments, one representing a material,

and the other an area, flat surface or container onto (or into) which the material is applied (or from which it is removed) in the event described by the verb. The interesting thing about these verbs is that either the argument representing some material ('paint' in 16a), or the argument representing the surface on which the material is found ('the wall' in 16a), may appear as the direct argument of the verb. Verbs with similar 'meanings' exhibit this same alternation in many languages. Dutch and Japanese examples from Chapter 2 are repeated below:

17

Dutch: (De Groot(1984), from Dijk(1980))

a. Jan plant bomen in de tuin.

John plants trees in the garden

b. Jan beplant de tuin met bomen.

John be-plants the garden with trees.

Japanese: (Fukui, Miyagawa, Tenny (1985))

a. kabe ni penki o nuru  
wall on paint ACC paint(VERB)  
smear paint on the wall

b. kabe o penki de nuru  
wall ACC paint with paint(VERB)  
smear the wall with paint

a. taru kara sake o akeru  
barrel from sake ACC empty  
empty sake from the barrel

b. taru o akeru  
barrel ACC empty  
empty the barrel

A similar alternation in which goals may be direct arguments is not generally possible:

18

push a cart to San Francisco  
\*push San Francisco with a cart

walk your dog to the corner  
\*walk the corner with your dog

The locative alternation seems to be associated with the verb having a goal argument that is a flat surface or area or a container. We must ask the question: why should the syntactic arrangement of the verb's arguments depend on such a seemingly trivial semantic property? The answer may be found in the aspectual properties of the verb's direct argument. The direct argument (if it undergoes change) must provide a scale for the event; it must measure out the event over time. A material is easily construed as measuring out the event, since it is consumed a little at a time during the course of the event, and when it is used up the event is finished. However, a goal is not so easily construed in this way, unless the goal is a flat surface or area or container. Consider an event in which a material is applied to a flat surface. A flat surface makes a natural scale for such an event because the material, having no form of its own, takes on the form of the surface to which it is applied, and spreads out evenly across the surface. As it spreads out it covers more and more surface area, and so the surface area may be thought of as measuring out the event. Likewise with a container. As the material enters the container, the container becomes more and more full. The fullness of the container measures out the event.

This is what the cognitive structure associated with the lexical entry of the verb must capture. This is the property that allows the locative alternation to take place.

Spray/load verbs allow the goal to be their direct argument in the syntax exactly because spray/load verbs describe events in which the goal may be construed as measuring out the event.

We need only a cognitive structure expressing this fact about spray/load verbs, and the aspectual constraints on the interpretation of the direct argument will predict that the alternation to be possible.<sup>23</sup> Now consider the sentences:

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23. More precisely, the aspectual constraints on the direct argument predict that the verb may be marked as allowing the alternation. It must be noted that the fact that a verb describes an event involving a material and a flat surface or container is a necessary but not sufficient condition for the locative alternation to be possible. The verb's arguments -- the event participants -- must be marked as to whether they are possible direct arguments. Besides satisfying the aspectual constraints, being a direct argument requires selection by the verb. For example:

- a. fill the glass with water
- b. \*fill water in the glass

a) is possible and b) is not, although the event described is of the kind that should permit the locative alternation. There is semantic selection of the container argument by the verb 'fill', since 'fill' requires as its direct object something that can be filled:

- fill the glass
- ?fill the wall (?with bookshelves)
- \*fill the pole

There is no semantic selection of the material argument by 'fill', because 'fill' holds no information about what the container may be filled with.

The converse is illustrated by 'pour':

19

- a. spray the paint in the bucket
- b. spray the bucket with paint

The preposition `in' in 19a explicitly relates the bucket to the event described in a particular way; the paint is directed into a constrained area of the bucket, rather than being spread out over some indefinite extent of surface area.

Although 19b is a grammatical sentence, it is not a paraphrase of 19a. When the bucket is the direct argument of the verb, the `in' meaning is lost and only the interpretation in which the bucket measures out the event of spraying is available.

-----

\*pour the glass with water  
pour water into the glass

`Pour' constrains the material to be something `pourable':

pour water  
?pour trees (?down the mountainside)  
\*pour pastures

but `pour' says nothing about what the material is to be poured into or onto.

Direct argument-hood is associated with the ability of the verb to semantically select the argument, but the aspectual properties associated with direct argument-hood are more important. Verbs which fulfill the aspectual conditions for the locative alternation can often be reanalyzed as participants in that alternation, even when they do not semantically select for both material and goal arguments. All the following are good in the author's judgements:

pour concrete on the roads  
pour the roads with concrete

fill the coffee up to the rim of the cup  
fill the cup up to the rim with coffee

19b can only mean that the paint was spread around some surface area of the bucket.

Consider the verb phrases below:

20

- a. spray the wall with water
- b. spray the wall with a hose

In both (a) and (b) above, 'wall' is the direct argument. The indirect argument is a material, 'water', in 20a and an instrument, 'hose', in 20b. 20a can participate in the locative alternation while 20b cannot:

21

- a. spray water on the wall
- b. \*spray a hose on the wall

Water, a material, is consumed during the spraying. The water sprayed during each subinterval of time during which the spraying takes place is understood to be different from the water sprayed in the next subinterval of time. The hose, an instrument, is not consumed in the spraying. As this event is described, all the hose participates in each subinterval of the event; rather than different pieces of the hose participating in different subintervals of the event. Because a material is consumed during an event, it can 'measure out' the event over time, and can participate in the locative alternation, appearing as a direct argument. Since an instrument is not consumed over time, it cannot measure out the event, and cannot participate in the locative alternation.

in 21b.

Path arguments have much in common with the goal arguments of spray/load verbs. Paths may be direct arguments for the reason that they measure out the event. Consider these sentences:

22

- a. walk the bridge
- b. walk on/across the bridge
- c. walk to the bridge

'Bridge' is the direct argument of 'walk' in 22a but not in 22b and 22c. When it is the direct argument of the verb, it can only be understood as a path, because in this position it is forced to measure out the event of walking. For this reason only 22b can be a paraphrase of 22a. 22c does not express an event in which the bridge itself measures out the event of walking, and so it cannot paraphrase 22a.

The behavior of spray/load verbs and path objects provides further evidence that the direct argument of the verb is constrained to provide a scale for the event described by the verb when it undergoes change.

#### 6.4 Body part/possessor alternation

Inalienable possession is a semantic relation with interesting grammatical consequences in many languages. It is exemplified by the relationship between body parts and their possessors. English verbs of contact permit an alternation such as the following when they have, as arguments, body parts and their possessors:

23

- a. hit Bill's arm
- b. hit Bill on the arm
  
- a. beat a man's shoulders
- b. beat a man on the shoulders
  
- a. kiss her sister's cheek
- b. kiss her sister on the cheek
  
- a. tap Joe's shoulder
- b. tap Joe on the shoulder
  
- a. poke the cat's nose
- b. poke the cat on/in the nose

The verbs above are verbs of contact which have unaffected direct arguments. In the a) sentences the body part is the direct argument. In the b) sentences it is not the direct argument; rather, the direct argument is the possessor of the body part, and the body part is a further specification of the direct argument. The prepositions 'on' or 'in' express the idea of contact. This alternation is not possible with affectedness verbs, even when they involve contact:

24

- a. break John's foot
- b. \*break John on the foot
  
- a. wash Mary's face
- b. \*wash Mary on the face
  
- a. redden the clown's nose
- b. \*redden the clown on the nose
  
- a. paint Bess' toenails
- b. \*paint Bess on the toenails

Since an affectedness verb requires its direct argument to 'measure out' and delimit the event, that direct argument may not be further specified as in the b) examples above. The scale through which the event is measured out is determined by the verb and the direct argument. Consequently the direct argument is not modifiable by adverbials that would alter the scale itself. Some point on that scale may be marked by delimiting adverbials:

25

paint Bess' toenails halfway/up to the edges/all over.

but this kind of semantic contribution is quite different from a further specification of the direct argument. The requirement that the direct argument provide a scale for the event blocks such further specification.

The view that this requirement is due to syntactic argument structure rather than to the semantics of individual verbs is supported by the fact that further specification of the direct argument of affectedness verbs is impossible even when it is implicit in the verb:

26

\*decapitate the chicken on the head  
\*peel the apple on the skin

Even though it is the head and the skin that is removed in the events as described above, the syntactic direct arguments -- 'the chicken' and 'the apple' -- are what measure out and delimit the events, as those events are described in these verb phrases. The constraint is also not due to the fact that the object referred to in the further specification may not itself 'measure out' the event. 'Skin' may also be the direct argument of 'peel':

27

peel the skin (off) the apple

The aspectual constraint on direct arguments provides an explanation why the body part/possessor alternation is not possible for affectedness verbs.

### 6.5 Psych verbs

Certain verbs expressing psychological states or events ('psych verbs') take as one of their arguments what is generally referred to as an experiencer. In the two sentences below, 'John' is an experiencer:

28

John fears ghosts.  
Ghosts frighten John.

Because experiencers can appear in either internal or external

argument position, it would seem that they are a type of event participant that does not map consistently into syntactic argument structure. If this is true, psych verbs pose a problem for the idea that there is a principled mapping between cognitive structure and syntactic argument structure. But this is only true as long as thematic roles, represented by terms such as 'experiencer', are what the mapping principles refer to. However, if we consider that it is not thematic roles but aspectual principles, that govern the interface between cognitive structure and syntactic structure, then psych verbs are not aberrant.

Belletti and Rizzi (1986), in a paper on psych verbs in Italian, show that there are two classes of Italian psych verbs. One group has the experiencer as an external argument and the other has the experiencer as an internal argument.<sup>1</sup> I will review two of the pieces of syntactic evidence presented by Belletti and Rizzi in support of this.

Deep subjects (non-derived subjects) in Italian can bind anaphoric clitics, as in 29a below. Derived subjects cannot, as in the passive example in 29b and the raising example in 29c. (Examples 29 through 34 are from Belletti and Rizzi (1986).)

-----

1. Belletti and Rizzi actually discuss three classes of psych verbs, but in two of these classes the experiencer is an internal argument.

29

- a. Gianni si è fotografato  
"Gianni himself photographed."
- b. \*Gianni si è stato affidato.  
"Gianni to-himself was entrusted."
- c. \*Gianni si sembra simpatico.  
"Gianni to-himself seems nice."

Verbs like `temere' ("fear", in 30) and `preoccupare'  
("worry", in 31) pattern like deep-subject verbs and  
derived-subject verbs respectively:

30

Gianni si teme  
"Gianni himself fears."

Io mi conosco  
"I myself know."

31

\*Gianni si preoccupa  
"Gianni himself worries."

\*Io mi interesse  
"I myself interest."

Secondly, the Italian causative construction is incompatible  
with embedded derived subjects:

32

- a. Gianni ha fatto telefonare (a) Mario  
"Gianni made Mario call."
- b. \*Gianni ha fatto essere licenziato (a) Mario  
"Gianni made Mario to be fired."

The embedded phrase in 32b is passive and therefore has a  
derived subject. 32b is consequently ungrammatical. 32a,

which has a non-derived subject in the embedded phrase, is grammatical. The `temere' class of verbs may be embedded under a causative while the `preoccupare' class of verbs may not:

33

Questo lo ha fatto temere/apprezzare/ammirare ancora di piu a Mario.

"This made Mario fear/estimate/admire him even more."

34

\*Questo lo ha fatto preoccupare/commuovere/attrarre ancora di piu a Mario.

"This made Mario worry/move/attract him even more."

Psych verbs in Italian are thus shown to fall into distinct classes with distinct syntactic behaviors, due to the difference in their syntactic argument structures. Verbs with external-argument experiencers behave like deep-subject verbs, while verbs with internal-argument experiencers behave like derived-subject verbs.

The question that must be considered is whether internal-argument experiencers and external-argument experiencers actually have the same semantic properties. If they do they pose a problem for a view such as that formulated in Baker's UTAH and the UAH. I will examine the English equivalents of the following Italian verbs cited by Belletti and Rizzi. The `temere' class of verbs includes:

35	
temere	"fear"
conoscere	"know"
accettare	"accept"
ammirare	"admire"
apprezzare	"like"
rispettare	"respect"

The `preoccupare' class of verbs includes:

36	
preoccupare	"worry"
interessare	"interest"
attirare	"attract"
commuovere	"move"
entusiasmare	"excite"
affascinare	"fascinate"
appassionare	"excite"
spaventare	"frighten"
disgustare	"disgust"

The English glosses of the Italian verbs in 35 and 36 are themselves psych verbs that belong to the respective classes. The experiencer argument of the `fear' class (under 37) is the deep-structure subject, while of the `worry' class (under 38) it is the deep-structure object:<sup>2</sup>

37  
 John fears the truth.  
 John knows the truth.  
 John accepts the truth.  
 John admires the truth.  
 John likes the truth.  
 John respects the truth.

38  
 The truth worries John.

-----

2. Independent principles of grammar prohibit any other analysis.

The truth interests John.  
The truth attracts John.  
The truth moves John.  
The truth excites John.  
The truth fascinates John.  
The truth frightens John.  
The truth disgusts John.

Since the salient readings for the examples in 37 and 38 are non-delimited readings it is difficult to use delimitedness as a test. However, some of the sentences above can in some situations be construed as describing delimited events. These non-salient readings are emphasized in the following examples. (The psych verbs and their internal arguments are underlined in these examples.)

39

The prophet went into the desert to fast and pray, and in three days he knew the truth.

It took Sebastian a year to accept the truth about his origins.

40

The play moved the audience in the first ten minutes of its performance.

The livestock were usually slow to arouse to fear, but the truck's backfiring frightened the cattle in an instant.

When these psych verbs do yield a delimited reading, it is the internal argument that delimits the event:

41

After two days the prophet knew the truth halfway; he knew half the truth/??half of him knew the truth.

?After the first two minutes of the play the audience knew the outcome halfway; the audience knew half the outcome/\*half of the audience knew the outcome.

Sebastian accepted the truth about his origins slowly, accepting only a little bit of the truth at a time/\*only a little of him accepting the truth at a time.

42

The play moved the audience quickly, moving a lot of the audience at once/\*a lot of the play moving the audience at once.

?The play moved the audience halfway; half the audience were moved/\*half the play moved the audience.<sup>3</sup>

The truck's backfiring frightened the cattle quickly; frightening a lot of the cattle at once/\*a lot of the noise frightening the cattle at once.<sup>4</sup>

?The truck's backfiring frightened the cattle halfway; Half the cattle were frightened/\*Half the noise frightened the cattle.

The judgements for the examples in 41 and 42 are somewhat muddy. The fact that the internal argument delimits the event is a little clearer in 43 and 44 below. Additional delimiting expressions in the verb phrase refer to the scale provided by the internal argument:

43

The children feared the movie to the end.  
\*The movie frightened the children to the end.

44

\*The children feared the movie to death.

-----  
3. 'Halfway' is not meant to be a depictive secondary predicate on the subject here.

4. These sentences are awkward because the speaker or hearer must not only imagine a delimited reading of 'frighten', but a durational reading as well.

The movie frightened the children to death.<sup>5</sup>

There is a further aspectual difference between internal argument experiencers and external argument experiencers. When a psych verb with an external argument experiencer describes a delimited event, that event has duration, because it must be an event in which the action progresses through the internal argument over time:

45  
accept the truth gradually

When a psych verb with an internal argument experiencer describes a delimited event, the event is generally an instantaneous one, because the experiencer is undergoing a change of state:

46  
?frighten children gradually

The difference between 45 and 46 results from the differing ways an experiencer and a non-experiencer undergo change; and therefore, the differing ways in which they are capable of delimiting an event. These are non-linguistic facts with linguistic consequences. The AIH is responsible for the translation of one into the other.

Psych verbs with experiencer arguments conform to the

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5. 'To death' is a delimiting expression in its literal interpretation.

aspectual constraints on internal and external arguments. They do not represent an unprincipled mapping of cognitive structure into syntactic structure. Rather than saying that an experiencer is sometimes mapped to external argument position and sometimes to internal argument position, the correct generalization is that an experiencer is a kind of event participant that may be cast in linguistic terms as measuring out or as not measuring out an event.

#### 6.6 UTAH and thematic roles

The Universal Theta Assignment Hypothesis of Baker (1985) and the Universal Alignment Hypothesis of Perlmutter and Postal (1984) propose a strict correspondence between thematic roles (or 'meaning') and structural positions (or grammatical relations). These hypotheses as they stand are stipulative. It would be desirable to put them on a more principled basis. The aspectual principles of argument structure advanced in this thesis can do that. I will focus in the following discussion on the UTAH, although the consequences of these ideas apply to both hypotheses.

The characterizations of thematic roles such as agent, patient, theme, goal, source, etc. encompass a variety of information. Being an agent, for example, may imply animacy, volition, and causation. But the crucial thing about an agent participant in a linguistically described event is that it represents change, motion or activity that is not

characterizable as change in a single parameter or property. Animacy, volition or causation may be associated with such change for reasons discussed in section 6.2.4 -- but these are extra-linguistic reasons. Such an event participant must be mapped to the external argument position because of that position's lack of aspectual constraints on the argument. A theme represents an event participant that can be characterized by a change in a single property -- and consequently, themes are mapped to internal argument positions. Gruber's characterization of the theme as, "the entity which is conceived as moving or undergoing transitions" (Gruber (1965) p. 38) partly captures this fact.<sup>6</sup> Sources and goals represent arguments that delimit the event described, by indirectly putting a temporal limit on the change (usually in location) undergone by another argument - the direct argument. For this reason sources and goals may be mapped to positions as indirect arguments within the verb phrase. Instruments and materials differ minimally in their aspectual properties. Materials are consumed over time, during the course of the event, while instruments are not. The difference between a material thematic role and an instrument thematic role can be minimally characterized in these aspectual terms -- that is, in terms of how they map

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6. Since Gruber includes the subjects of unergative verbs of motion in the category of themes, 'theme' for Gruber does not mean change describable as change in a single property.

into the event temporally. Section 6.3 demonstrated that the aspectual properties of instruments and materials may determine how they appear in argument structure. The aspectual properties of event participants, imperfectly expressed by 'thematic roles', are what govern the position of a verb's arguments in the syntax. The aspectual principles of argument structure put the correlation between thematic roles and argument positions on a principled basis.

Thematic roles are often employed in linguistic theory and in the literature without the backing of a proper theory of thematic roles. The theory of thematic roles, such as it is, seems to lack a rigorous and consistent set of diagnostics of the various role types. For this reason thematic theory is looser than other aspects of grammar which are better understood. The aspectual approach to thematic roles proposed here offers a means of setting up a rigorous and explicit typology of thematic roles that would interact with syntax in a principled way. The aspectual information in thematic roles is linguistic information, relevant to syntactic argument structure. An aspectual characterization of thematic roles would extract this information from the extra-linguistic information, simplifying our picture of the interface between syntax and lexical semantics. It would maintain a view of a precise and computationally explicit syntax, divorced from dependence on anything so loosely defined as thematic roles (in terms of agent, patient, etc.). It would account for

regularities in the mapping between cognitive structure and syntax simply and explicitly. For theoretical and empirical reasons, an aspectual theory of thematic roles is an attractive option.

#### 6.7 Thematic hierarchies and the mapping of cognitive structure into syntactic structure

The Aspectual Interface Hypothesis holds that the mapping between cognitive structure and syntactic argument structure is mediated by aspectual properties. This makes the prediction that thematic hierarchies are not necessary as mapping principles between cognitive structure and syntactic structure. Where thematic hierarchies appear to be necessary they should be supplantable by the AIH. With this end in view I will examine two thematic hierarchies proposed in the literature; one by Jackendoff (1972) which applies in passivization,<sup>7</sup> and one by Belletti and Rizzi (1986), which applies to psych verbs.

Jackendoff (1972) argues for the following thematic hierarchy:

- 47  
1. Agent  
2. Location, Source, Goal

-----

7. Passivization may, in the broad view, be considered as related to syntactic argument structure, since passivization rearranges the arguments of verbs in particular ways.

### 3. Theme

Jackendoff (1972) maintains that the following Thematic Hierarchy Condition holds in passivization:

48

The passive `by'-phrase must be higher on the Thematic Hierarchy (in 47) than the derived subject.

He cites the following sentences in support:

49

- a. The bookcase was being touched by John.
- b. The car was hit by John (?with a crash).
- c. \*Five dollars are cost by the book.
- d. \*Two hundred pounds are weighed by Bill.
- e. \*Harry is struck/impressed by Bill as pompous.
- f. Bill is regarded by Harry as pompous.

According to Jackendoff, the Thematic Hierarchy Condition explains these examples in the following way: In 49a and 49b, `the bookcase' and `the car' are Locations or Goals.<sup>8</sup> The sentences are only acceptable when `John' is an Agent, even though the non-passive counterparts are acceptable with John in a non-agentive role:

50

John touched the bookcase.  
John hit the car (?with a crash).

When `John' is an Agent, the thematic hierarchy is satisfied and the sentences are grammatical. In 49c and 49d, `five

-----

8. I will capitalize the names of thematic roles when they are used according to Jackendoff's theory.

dollars' and 'two pounds' are Locations, while the object of the 'by'-phrase is a Theme. The thematic hierarchy is therefore violated, and the sentences are bad. In 49e 'Harry' is a Goal and 'Bill' is a Theme; the thematic hierarchy is violated, and the sentence is bad. In 49f, 'Bill' is a Theme and 'Harry' is a Goal, the thematic hierarchy is not violated, and the sentence is fine. (Jackendoff determines the nature of the thematic role from the kind of prepositions that may be employed with it.)

On a closer examination of the data, it is not so apparent that a Thematic Hierarchy Condition is necessary for a satisfactory explanation. Consider first the psych verb cases, 49e and 49f. Following the discussion in section 6.5, these two sentences differ minimally in that 49e has the experiencer as underlyingly an internal argument and 49f has the experiencer as an external argument. The pattern illustrated by 49e and 49f is not a general pattern with psych verbs:

51

- a. The uncertainty of the future is feared by many people who lack faith in themselves.
- b. Many people who lack faith in themselves are frightened by the uncertainty of the future.
  
- a. The power of the military is respected by the opposition party.
- b. The opposition party is disgusted by the power of the military.

- a. Chocolate ice cream with candy cherries is liked by every five-year-old.
- b. Every five-year-old is pleased by chocolate ice cream with candy cherries.

The a) examples in 51 above have internal argument experiencers and the b) examples have external argument experiencers. All the sentences are in the passive form. Though the b) examples may seem marginally more natural than the a) examples, there is not a strong enough difference between them to judge the a) examples as unacceptable or ungrammatical. The difference may be due to conditions of felicity in discourse -- perhaps a condition that requires the subject to be salient by containing a relatively high amount of new information. The tendency for the a) sentences to be awkward is counteracted by increasing the emphasis on and information in the subject:

52

??Ice cream is liked by five-year-olds.

(?)Chocolate ice cream with candy cherries is liked by five-year-olds.

Chocolate ice cream with candy cherries IS liked by five-year-olds.  
 (in response to the statement that five year olds only like strawberry ice cream with marshmallows.)

The effect noted by Jackendoff then, is not of the kind that warrants a Thematic Hierarchy Condition that interacts with syntactic processes.

Now consider 52c and 52d. These are not, strictly speaking, ruled out by the Thematic Hierarchy Condition, because they are unacceptable without any `by-' phrase being present at all:

57

\*Five dollars are cost.

\*Two hundred pounds are weighed.

A Thematic Hierarchy Condition cannot account for this data unless it refers to implicit `by-' phrases, which would be problematic. The sentences are not ruled out on pragmatic grounds either. One could imagine a situation in which it would be pragmatically possible to say something like this. For example, in response to the question, "How much does this book cost?" The sentences above are not ruled out pragmatically, nor are they ruled out by the presence of an improper `by-' phrase.

The ungrammaticality of 57 is an interesting fact in need of explanation. There are a number of verbs that do not passivize well, verbs of measurement among them. The unacceptability of passives of verbs of measurement may be related to the unacceptability of passives of the copula:

58

a. The barn is red.

b. \*Red is been by the barn.

a. Maxwell is a terrorist.

b. \*A terrorist is been by Maxwell.

Verbs of measurement express 'meaning' close to that of the copula, and are in fact replaceable by the copula:

59

- a. Bill weighs 200 pounds.
- b. Bill is 200 pounds.

- a. The book costs five dollars.
- b. The book is five dollars.

The impossibility of passivizing the copula is not surprising. The passive involves a morphological and syntactic operation. Verbal morphology is often particular about what classes of verbs it may be applied to. This in itself does not constitute a need for something like a Thematic Hierarchy Condition, since we expect verbal morphology to have lexical constraints.

A final problem with the Thematic Hierarchy Condition as proposed by Jackendoff is that it is not clear that the thematic roles of the arguments can be clearly and unambiguously diagnosed. Jackendoff assumes 'Harry' to be a Goal in 53e and 53f. However 'Harry' in 53f (repeated below as 60) has many agent-like properties.

60

Bill is regarded by Harry as pompous.

For example, one may ask about 'Harry',

61

What did Harry do after Bill came to the meeting in a tuxedo?

and receive as an answer,

62

Harry regarded Bill as pompous.

The following is also possible:

63

What Harry did when Bill vaulted over the table was to regard Bill with a look of astonishment.

The applicability of `do' is generally considered a good test for agency. If one may be said to `do something', one has agent-like properties. While `John' in 64a below may have an agentive or a non-agentive interpretation, `John' must be an agent in 64b:

64

- a. John touched the wall.
- b. What John did was to touch the wall.

The subject of `regard' is in many ways like an agent, yet it is identified as a Goal by Jackendoff. I do not mean to establish here that it is one or the other, merely to demonstrate that the thematic roles of event participants are not always as straightforwardly identifiable as they might seem.<sup>9</sup>

To conclude the preceding discussion, the Thematic Hierarchy

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9. See Dowty (1986) for an interesting discussion of this point.

Condition of Jackendoff (1972) is unnecessary, as it is applied to passivization, although an interesting question remains as to why it is impossible to passivize the copula. Furthermore, the Thematic Hierarchy Condition lacks the rigorous set of diagnostics for thematic roles that are necessary for it to be useful as a truly grammatical principle.

Jackendoff (1972) also argues for the imposition of the Thematic Hierarchy in reflexivization and control. These are phenomena that involve coreference and binding rather than the syntactic manifestation of argument structure so I will not address them. It is clear that lexical semantics plays a large part in control, and not impossible that it plays some role in reflexivization. However, since these are processes of a more interpretive, less structural nature, their intersection with 'meaning', lexical semantics or cognitive structure need not be mediated by aspectual properties and the Aspectual Interface Hypothesis.

Belletti and Rizzi (1986) have also proposed a thematic hierarchy in the mapping (or projection, in their terminology) of the arguments of Italian psych verbs into syntax (from Belletti and Rizzi (1986)):

65

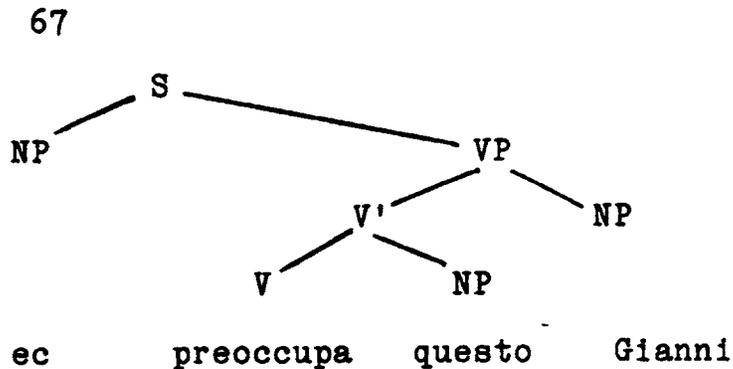
Given a Th-grid (Experiencer, Theme) the Experiencer is projected to a higher position than the Theme.

...where 'higher' means 'asymmetrically c-commanding'.

Belletti and Rizzi argue on syntactic grounds that sentences such as,

66  
 Questo preoccupa Gianni.  
 "This worries Gianni."

have underlying structures like the following:



In this structure, 'Gianni' c-commands the other internal argument, 'questo'. Belletti and Rizzi regard 'Gianni' as experiencer and 'questo' as theme. They conclude that a general mapping principle that maps thematic roles into syntax is required, to explain this structure. If this is true it poses a problem for the Aspectual Interface Hypothesis.

An aspectual account of the mapping is available. Recall from the discussion in section 6.5 that an experiencer in internal argument position may be capable of measuring out and delimiting the event (i.e., of being an affected object). In the absence of any other delimiting argument, the experiencer

must be the direct argument. Adopt the following refinement of the principles of argument structure laid out in Chapter 4:

68

The internal argument, the argument that is capable of measuring out and delimiting the event, is the highest NP object under the VP node.

With the refinement as stated above, the thematic hierarchy proposed by Belletti and Rizzi is subsumed under general principles of argument structure. The fact that the experiencer must c-command the other internal argument follows from general aspectual constraints on argument structure.

The preceding discussion has argued that thematic hierarchies proposed by Jackendoff and Belletti and Rizzi to account for the mapping (or projection) of cognitive structure into syntactic structure are either not necessary, or can be stated within a general aspectual theory of argument structure. This is a small portion of the work that needs to be done to test the Aspectual Interface Hypothesis, but it does demonstrate its plausibility. The strongest evidence for the kind of interaction between thematic roles and syntactic argument structure that has fueled thematic hierarchy theories is the simple fact that, to the best of my knowledge, agents always show up in external argument positions and themes show up in internal argument positions. But this is accounted for simply and explicitly by the aspectual theory proposed in this thesis, in which very particular aspectual/semantic

constraints obtain of internal arguments. Themes are the kind of event participants that can meet those constraints;<sup>10</sup> agents are the kind of event participants that cannot meet them.

The Aspectual Interface Hypothesis imposes certain requirements on the lexical entries of predicates. Predicates must be associated with a certain number and type of event participants -- this is nothing new. The type of the event participants may be expressed by something like the terms 'agent', 'patient', etc. -- this is also nothing new. However, the Aspectual Interface Hypothesis says that the crucial information about thematic roles is certain aspectual information. Each event participant must be marked as to:

(i) whether it undergoes change or not, and if so, if it undergoes change in such a way that it can measure out the event; i.e., whether the event participant can be an internal argument or not. Most verbs will have only one; spray/load verbs will have two of these.

(ii) if it is not capable of being a direct argument, whether it has any inherent case.

(iii) whether it must delimit the event indirectly by marking a point on the scale laid out by the direct argument. If so, it must be mapped to an oblique argument position within the VP.

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10. I am not using the term 'theme' here in Belletti and Rizzi's sense in which the causer of the effect on the experiencer is called a 'theme' (as in 65). This is a further illustration the problems resulting from the looseness of the traditional nomenclature for thematic roles.

The requirements listed above leave several questions open. First, the question as to whether there are arguments that must be marked as external is left open. Agents are the only candidates for such marking. It is clear that agents cannot be internal direct arguments, but it is not clear that they cannot be internal oblique arguments. For example:

69  
John built a house with Bill.

The salient interpretation is one in which `Bill' is an agent, yet `Bill' is not an external argument. Agents are usually external arguments, but they do not have to be. Recall furthermore from Chapter 4 that external arguments do not have to be agents. These facts argue that it is the internal argument and not the external argument that is marked in the lexical entry of the verb.<sup>11</sup>

A second question left open is that of optional arguments and adjuncts. How are they to be represented in the lexical entry of a predicate? I have bypassed this problem up to now by taking the broadest view and considering every NP within the verb phrase as a potential argument. (The phrase `with Bill' for example, in 69 may be better regarded as an adjunct than an argument phrase.) Aspectual properties were shown in

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11. Williams (1981) and Stowell (1981) argue for the marking of external arguments in lexical entries.

Chapter 4 to have something to say about the difference between adjuncts and arguments, but I will not follow this up here. The question of the proper treatment of adjuncts versus arguments in the lexical entries of predicates will be put aside for future research.

The formulation of the requirements on lexical entries of predicates outlined above suggests that the mapping from cognitive structure to syntactic structure proceeds as follows:

(i) map an argument that is marked as a possible direct argument into the direct argument position. It receives structural accusative case.<sup>12</sup>

(ii) map other arguments marked as possible recipients of inherent case into oblique argument positions within the VP (or positions as objects of prepositions).

(iii) map an argument into external argument position. If there is an argument incapable of being mapped in (i) and (ii) (this will usually be an agent), it must become an external argument

Under this mapping procedure the external argument is not distinguished before it is mapped into the external argument position. The external argument is certainly distinguished syntactically (and aspectually) once it is mapped into the syntax, but under the view espoused here, it is not inherently so distinguished in the cognitive structure associated with the lexical entry. It is rather the internal direct argument

-----  
12. Or nominative case after passivization.

that is special, in the lexical entry. Anything can be an external argument but only very particular kinds of things can be direct internal arguments. If (ii) and (iii) are freely ordered, the mapping procedure will allow non-agents to occupy external argument position (which does happen). The mapping also predicts that agents will not be blocked absolutely from occupying oblique argument positions, if the appropriate inherent case (or the preposition) is available in the language.

#### 6.8 The AIH and learnability

The Aspectual Interface Hypothesis has been proposed as the connection between cognitive structure and linguistic structure. The AIH maintains that the aspectual properties of events constitute a kind of 'shared language' between the two systems. We must ask the question: how do children learn the aspectual properties of verbs? Do they first know the aspectual meanings and hook them up to the right syntax, or do they hear the syntax and discover the aspectual meanings? It is difficult to answer such a question knowing as little as we do about cognitive structure, but some speculation is possible.

Cognitive structure and linguistic structure are separable, since higher mammals and very small children who do not have a command of language must be credited with sophisticated cognitive abilities. When the child has the cognitive ability

to characterize or classify events, she also knows what aspectual properties the events may have. The process of learning the argument structure of verbs is then a process of connecting the general event type of a verb with a possible aspectual characterization of the event. Some kinds of events may be characterized aspectually in only one way; for these the child has essentially nothing to do. Others may be characterized in several possible ways; for these it is a matter of choosing one of several possible aspectual instantiations of the event type. Positive evidence will be available from the syntax to guide this choice.

Even though verbal argument structures must be learned, the shared vocabulary of aspectual properties, at the interface of cognitive and linguistic structure, makes that task relatively simple. The AIH helps to explain how children can learn language as quickly as they do.

To conclude, the Aspectual Interface Hypothesis contributes to an explanation of the ease with which children learn language; provides a principled basis for the correlation of cognitive structure and syntactic argument structure; suggests the outlines of an explicit theory of thematic roles; provides a plausible alternative to thematic hierarchies and linking rules; accounts for certain diathesis alternations simply; and forms the basis of a principled statement of a constraint such as the UTAH or UAH. The Aspectual Interface Hypothesis is

theoretically and empirically worthy of serious consideration.

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