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Core events and adverbial modification

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7.1 Introduction

Adverbs have been problematic for theoretical syntacticians and semanticists for several reasons. First, because they are somewhat peripheral to the basic predicate-argument structure of a sentence, it has not been clear how they should fit into the compositional syntax or semantics underlying sentence structure.[1] Second, because adverbs do not present a unified class, in order to understand them, it is first necessary to establish the right taxonomies. Theoretical analyses of adverbs have often focused on the problem of defining the classes of adverbs that must be distinguished on either semantic or syntactic grounds, the central syntactic issue being the relatively free distributional patterns of different kinds of adverbs. Third, because adverbs demonstrate correlations between syntactic and semantic structure, the behavior of adverbs could be (and has been) analyzed as both semantic and syntactic phenomena; there are a number of different distributional classes of adverbs, and it is a serious question whether these

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[1]Adverbs have been treated **as** semantic predicates (Rochette **1990,** Roberts 1985), **as** modifiers (Sportiche 1988), as operators (Laenzlinger 1996), and as arguments (McConnell-Ginet **1982,** Larson **1985).**

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are to be treated as syntactic or semantic classes.[2] I take this as evidence that adverbs are inextricably bound up with both syntax and semantics; and therefore must inform and be informed by any theory about the interface between them. They present a rare window into the nature of the syntax/semantics interface.

To understand the role adverbs play in syntax/semantics correspondences, we must ask the question: What syntactic or semantic elements or constituents do we need to refer to in explaining the distribution and properties of adverbs? The purpose of this paper is to demonstrate that part of the answer to this question must come from event structure. In particular, certain elements of event structure are crucially referenced or invoked by certain types of adverbs. This paper makes the following points, in addressing the issues outlined above:

- There are two elements of event structure which must figure in adverb taxonomy and behavior: the *measure* or *path*, and the *core event*.
- Lexical semantic verb classes can be defined on the basis of whether or not they contain these elements of event structure. The co-occurrence of adverbs with these verb classes can be used as a diagnostic for the interaction of adverbs with these elements.
- Classes of adverbs may be distinguished by whether or not they interact with these elements; or in another way of looking at it, whether these elements are visible or opaque—accessible or inaccessible—to them. This paper distinguishes the following three classes of adverbs in this way: the measure adverbs, the restitutive adverbs, and the *almost* adverbs:

(1)

adverb class	*measure/path*	*core event*
measure adverbs	visible	visible
restitutive adverbs	opaque	visible
almost adverbs	opaque	opaque

- *Semantic zones* may be identified within the clause, with which different classes of adverbs may be associated. These semantic zones, under the view advocated here, are linked to a series of functional projections in an extended event structure for the clause.

This paper is organized as follows. Section **2** is a discussion of the state of adverb taxonomy in the literature, situating the three adverb classes in that context. The discussion is focused towards approaches to the role

[2] Adverbs have been examined and classified on a purely semantic basis by some authors, who focus on such things as their behavior with negation, presupposition, implication, question formation (See Bartsch 1976, Bellert 1977). (See also Wyner 1994.) In this paper I focus on those semantic characteristics of adverb classes that have been explicitly linked with syntactic patterns of behavior.

of adverbs in syntax/semantics correspondences. Section **3** introduces the event structure notion of core events and measure from the point of view of the lexical semantics literature (but also from formal semantics literature for the case of measure). Three lexical semantic classes of verbs are identified in this section. Sections 4 through **6** discuss each of the adverb classes in turn, showing their interaction with the three verb classes, and with the elements of core event and measure in the verb meanings. Finally, section 7 returns to the place of adverbs in syntax/semantics correspondences, situating them in the context of an extended event structure of functional projections and semantic zones.

7.2 Adverb Taxonomy and Syntax/Semantics Correspondences

The literature on adverbs demonstrates substantial agreement on some basic adverb taxonomy, which I assume. Jackendoff 1972 outlined the following four basic classes of adverbs (in a loose semantic characterization): the speaker-oriented adverbs (which introduce material pertaining to the speaker, e.g.: *frankly,* [illegible] subject-oriented adverbs (which introduce material pertaining to the subject of the sentence, e.g.: certain uses of *carefully, clumsily);* adverbs of manner, time or degree (material pertaining to the event; *eloquently, infrequently, completely);* and a special class of focusing adverbs *(merely, utterly).* Jackendoff established a correspondence between these semantic adverb types and their syntactic distribution, by showing that speaker-oriented adverbs and subject-oriented adverbs are sentence-level adverbs, while adverbs having to do with manner, degree, or time are verb phrase-level adverbs (in the traditional sense of verb phrase).[4] The evidence comes from the syntactic distribution of these adverb classes relative to hierarchical constituent structure, which reflects their syntactic scope: in the context of the syntactic assumptions of the 1970s, sentence-level adverbs can occur in positions dominated by the sentence node; verb phrase-level adverbs can only occur in syntactic positions dominated by the VP node; and the focus adverbs can only occur in auxiliary position. The *almost* adverbs, one of the three classes addressed in this paper, belong to Jackendoff's class of focus adverbs.[5] This taxonomy put some order into

[3] More subtle semantic refinements of the category of speaker-oriented adverbs have proved necessary and have appeared in the literature and been adopted by subsequent authors (see Huang 1975, Bellert 1977, Parsons 1990).

[4] In this section I use the term *verb phrase* in the traditional sense, to refer to all XP's below INFL in current analyses. In later sections I will refer to the upper and lower VPs in a decomposed-VP analysis. I trust the reader will find the context makes it clear what kind of VP is meant.

[5] There were also other taxonomic investigations of adverbs, besides Jackendoff's, appearing in the 1960's to 1980's, which were somewhat less comprehensive in scope. (See Koktova 1986 or Greenbaum 1969, who focus mostly on sentence adverbials.) Also,

the seemingly relatively free distribution patterns of English adverbs.[6]

Subsequent authors made the observation that some subject-oriented adverbs undergo a meaning change that correlates with what syntactic position they occupy (Jackendoff **1972,** McConnell-Ginet **1982,** Ernst **1984,** Travis **1988).** For example:

(2) Clumsily John spilled the beans.

(3) John spilled the beans clumsily.
(Jackendoff **1972,** p. **57,** # 3.50)

The adverb clumsily in initial position **(2)** means 'It was clumsy of John to spill the beans'. In final position it means 'John spilled the beans in a clumsy manner'. Adverbs such as these are sensitive either to the syntactic subject **(2)** or to the agent **(3).** (Subject-oriented adverbs modify the syntactic subject while agent-oriented adverbs modify the agent in the sentence. Generally the subject and the agent coincide, but occasionally they do not, and it is in these cases that we may distinguish subject-oriented adverbs from agent-oriented adverbs.) Some apparent manner adverbs may also be ambiguous depending on their syntactic position. For example, a rate adverbial like quickly in **(4)** is ambiguous:

(4) a. Quickly John will be arrested by the police.
b. John quickly will be arrested by the police.
c. John will quickly be arrested by the police.
d. John will be arrested by the police quickly. (Travis **1988, p. 292,** example **29)**

To quote Travis:

> In (a,b) quickly appears to be modifying the event of the arrest, while in (c,d) quickly modifies the process of the arrest. In other words, in (a,b) the arrest will happen right away. In (c,d) the manner of the arrest will be hurried.

Travis **1988,** using these observations, reorganized and simplified the Jackendovian taxonomy somewhat, proposing an essential distinction between adverbs licensed by event features in INFL, and adverbs licensed by manner features in the head verb. The adverbs licensed by the head verb include agent-sensitive adverbs and true manner adverbs, as in (4c,d); while the adverbs licensed by INFL include subject-sensitive adverbs, epistemic

besides Jackendoff's basic general four-way typology, some other more peripheral general classes have been recognized and discussed – for example, relational adverbs or **linking adverbials (Bartsch 1976, Greenbaum 1969).**

[6] **See Keyser 1968 for an earlier treatment of the problem of the relatively free distribution of adverbs in English. Keyser 1968 employed a transportability convention, which marked some elements in a language with the feature [+transportable].**

adverbs, and adverbs that modify the entire event as in (4a,b). Which syntactic constituent, INFL or verb, licenses the adverb thus determines its semantic interpretation, by virtue of the semantic features associated with it: event features for INFL or manner features for the verb.[7] (Travis speculates that the speaker-sensitive adverbs may be licensed by a discourse feature in COMP, and she does not address the interpretation of Jackendoff's class of focus adverbs.) For Travis, the speaker-oriented adverbs take scope over CP, the sentence adverbs take scope over IP, the subject-oriented adverbs take scope over INFL, and the manner or agent adverbs take scope over the verb. Both Travis and Jackendoff assume syntactic hierarchical structure to underlie the distribution and syntactic behavior of adverbs, and that in turn to govern their semantic interpretation (implicitly or explicitly) by virtue of the semantic elements associated with the syntactic constituents.

This general approach to the analysis of adverbs, invoking the interaction of syntax and semantics, has a strong place in the literature. Rochette 1990 proposes that the Jackendoff/Travis classes be further distinguished by their semantic selectional properties. Various types of adverbs may select for propositions, events, or actions; and this interacts with syntax to produce the various adverbial behaviors. Ernst 1997 argues that the interaction of the lexical scope properties of adverbs with syntactic principles, predicts to a large extent their behavior. Ernst proposes that adverbs may select for Fact/Event Objects, including (from larger to smaller units): speech acts, facts, propositions, events, and specified events.[8] All of these approaches share the idea that certain correspondences between syntactic and semantic composition together constrain adverb distribution and behavior. They find the explanations for the distribution of adverbs to lie in the way that the composition of syntactic constituents is associated with the composition of semantic elements. This is the approach underlying the ideas I will develop in this paper.[9]

A quite different approach to explaining the distribution of adverbs is taken by Cinque 1997 and Alexiadou 1997. Cinque 1997, an ambitious work of great scope, examines and uncovers strong cross-linguistic gener-

[7] Roberts 1985 also develops a typology based on Jackendoff's, with a distinction between adverbs related to INFL and those related to the verb. In contrast to Travis his analysis is cast in terms of predication, as opposed to licensing.

[8] Ernst in more recent work regards only Events and Propositions as primitives; the other distinctions are to be regarded as involving selection for other properties (Ernst p.c.).

[9] There is less consensus in the literature about the place of adverbs in phrase structure projections. Adverbs have been analyzed as occupying adjoined positions (Ernst 1997), as occupying specifier positions (Laenzlinger 1993, Cinque 1997), as projecting their own maximal projections (Pollock 1989), and as being defective categories without a maximal projection (Travis 1988).

alizations about adverb distribution, and he proposes that every attested adverb position be associated with a distinct functional projection.[10] Under this approach, the syntax explicitly designates the distributional properties of adverbs with only indirect recourse or instruction from a semantic component. Cinque's approach can support a view that some type of semantic composition parallels the syntactic composition, although the effects of semantic composition on adverb distribution are mediated by the available inventory of syntactic functional projections. The view that I will advocate in this paper treads a middle ground between these opposing views, on the respective roles of semantic composition and syntactic functional projections in determining adverb distribution. I will take the view that the semantic composition of the event is mediated in the syntax by a relatively small inventory of functional projections mirroring that composition.

I assume that it is possible to outline a general pattern of semantic composition, from the simple verb predicate, up through a sentence-level proposition that is related to the discourse context. Such things as the speech acts, facts, propositions, events and actions mentioned by Ernst and Rochette will figure among the semantic elements composed in this general plan. However, in this paper I am concerned with elements 'lower down' in the semantic composition: the event structure closer to the verb, and internal to the event, rather than with the speech acts, propositions, or facts which appear at the higher levels of composition. All of these elements must be part of the big picture but the intent of this paper is to work out only a few pieces of that puzzle.

The semantic composition of event structure is generally understood to be syntactically located within the verb phrase, and it is here that we look for the interaction of adverbs with event structure. The second two adverb classes discussed in this paper, the measure adverbs and the restitutive adverbs, are verb phrase adverbs in a Jackendoff/Travis taxonomy. The syntactic distinction between sentence-level and verb phrase-level adverbs is generally accepted by syntacticians, and the idea that adverbs occur in syntactic positions that reflect their scope and class has been used in syntactic argumentation (Pollock 1989; see also Iatridou 1990). A semantic distinction between sentence and verb or verb-phrase adverbs is also generally accepted, although the nature of that distinction and how it figures in semantic taxonomies of adverbs has been the subject of some discussion (Thomason and Stalnaker 1973, Lakoff 1973, McConnell-Ginet 1982.) However, there is not much literature on a general taxonomy of VP adverbials. Two kinds of VP adverbs have been addressed in the literature which are of interest here. There is some literature on the semantics of

[10] See Shaer 1997 and Ernst 1997 for some discussion of arguments against the functional projections approach to adverb distribution.

degree or grading adverbials (Bartsch 1976, Huang 1975, Moltmann 1991, 1997, Klein 1998). The measure adverbials are related to these and more will be said about them later. There has also been special attention paid to the syntax and semantics of temporal adverbials. Smith 1991 categorizes temporal adverbials into four classes (Smith 1991, p. 155, # 34):

(5) locating adverbials: *at noon, yesterday, before Mary left, etc.*
durative adverbials: ***for** an hour, **from** 1 to 3 PM*
completive adverbials: *in an hour, within an hour*
frequency adverbials: *often, never, 3 times a week, every week, etc.*

Of these four, the completive adverbials and the durative adverbials have the most potential for interaction with event structure, although they are not quite the same as either the restitutive or measure adverbs, and will not be specifically addressed here. (I return to them later.) The locating adverbials clearly operate at a higher level, operating over the entire event rather than entering into the substructure of the event as discussed here. The locating adverbials have been of special interest because of their referential and deictic properties, and some authors have related them to the semantics of tense (Hornstein 1990, Ogihara 1996, Vlach 1993, among many others). They share certain referential properties with adverbs of spatial location, and the common properties of temporal and spatial locating adverbs have been discussed (Lakoff 1970, Stroik 1992). Parsons 1990 treats temporal and spatial locating adverbials as predicated over entire events. The frequency adverbs also appear to quantify over entire events (Rothstein 1995) rather than some subpart of event structure, so they are outside of the compositional realm I focus on in this paper.

As paleontologists lightheartedly group themselves into lumpers and splitters—the lumpers tending to propose fewer distinct species based on the fossil record, the splitters proposing more—adverb analysts can be grouped into lumpers and splitters. Where semantic composition and syntactic composition together constrain adverb distribution and interpretation, as in the Jackendoff, Travis, Rochette, Ernst tradition, fewer syntactic categories of adverbs are proposed. Where syntactic functional projections constrain adverb distribution, **as** with Cinque (and to a lesser extent, Alexiadou), the number of syntactic adverb categories becomes quite large. The two classes of VP adverbs discussed here, the measure and restitutive adverbs, are not distinguished as separate classes by the lumpers. Cinque has a separate category for each of them, but these are not related to any expression of event structure. This paper proposes something of a middle path between the two approaches, where certain zones of semantic composition map to syntactic categories. I return to this in section 7.

7.3 Core Events, Measure, and Three Verb Classes

7.3.1 Core Events in the Lexical Semantic Literature

Lexical semantic research over the last several decades has produced a substantial literature on the lexical decomposition of verb meanings. The research has developed the idea that the meaning of a verb can be analyzed into a structured representation of the event the verb designates. This literature has recognized the need to represent in the meanings of certain kinds of verbs, an inner (or core) event associated with stativity and inchoativity. Generally, these are verbs describing some change of state, where the meaning of the verb involves some change of state in the verb's direct object. There is considerable variation in the kinds of representations employed in this literature, but in the sampling shown below in **(6)** through (10), we see a common theme of lexical decomposition into an outer event of causation, and an inner or core event of change or becoming, terminating in a final state.

(6) x CAUSE ((y BE DARK) CHANGE))
Carter **1976,** p. **6,** example 9b.

(7) He sweeps the floor clean:
[[*He sweeps the floor*] CAUSE [BECOME [*the floor is clean]*]]
Dowty **1979,** p. **93,** example 105.

(8) wipe the **floor** clean:
[x CAUSE [y BECOME (AT) z] BY [$_x$ 'wipe' y]]
Levin and Rapoport **1988,** p.2, example 2a.
[x CAUSE [floor BECOME (AT) *clean*] BY [x 'wipe' *floor]*]

In (6), from Carter **1976,** the meaning of the verb *darken* is represented as (paraphrased), *X causes y to change into a state of being dark.* A core event and final state is distinguishable in the representation: ((y BE DARK) CHANGE)). In (7), from Dowty **1979,** the meaning of the verbal expression *sweep clean,* as in *sweep the floor clean,* includes a distinguishable core event of the floor becoming clean. In (8), from Levin and Rapoport **1988,** the meaning of *wipe the floor clean* is again represented as including a core event of the floor becoming clean. Other representations have employed more syntactic-looking structures to show the existence of a core inchoative event. In (9), McCawley **1968,** working in the Generative Semantics tradition, represents the meaning of *kill* as including a subtree with the meaning *become not alive;* and in (10), Hale and Keyser **1993** employ Lexical Relational Structures to represent the meaning of the sentence *The cook thinned the gravy* as including an inner VP with an implicit inchoative verb, which represents the change of state in the gravy itself; i.e., the gravy's becoming thin; and an inner AP representing the final state of the gravy (being thin).

(9) kill:

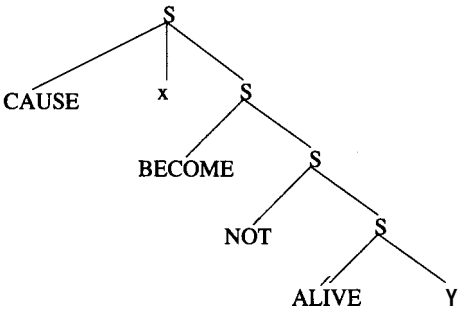
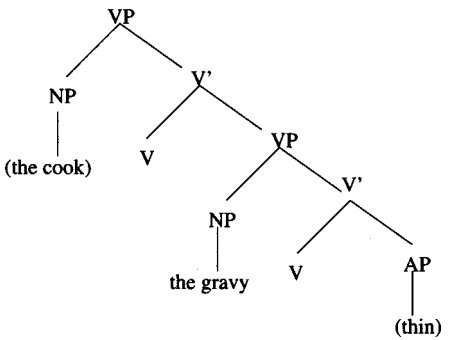


FIGURE 2 McCawley 1968, p. 73, Figure 3.

(10) The cook thinned the gravy:



Hale and Keyser 1993, p. 72, example 31.

Pustejovsky 1991 employs core events in his approach to the ambiguity of manner versus speaker-oriented adverbs. The sentence in (11a) could be interpreted as in (11b), the manner reading, or as in (11c):

(11) a. Lisa rudely departed.
b. Lisa departed in a rude manner.
c. Lisa's departure was a rude one (even though Lisa may not have acted in a rude manner while departing.)

Pustejovsky treats this ambiguity as a difference in scope over parts of event structure. Under Pustejovsky's approach, the event designated by

the verb *depart* has two components: a final state and a process, which is the complement of the state. In Pustejovsky's analysis, in (11c) *rudely* takes scope over the final state of the event (the state of having left); while in (11b) *rudely* takes scope over the process (the actions and manner associated with departing).

Across this variety of approaches, we see in this literature the widely accepted idea that change of state verbs include in their meaning a distinguishable core inchoative event involving a 'becoming' into a final state.

Although this literature focuses on change of state verbs, the same approach can be extended to incremental theme verbs (Dowty 1979), which are generally verbs of creation or consumption. These are verbs which have direct objects that are consumed or created over increments of time. Like the change of state verbs, the meaning of the incremental theme verbs involves a change in the direct object culminating in a final state, which may be represented as an inner event.[11] *Build* and *eat* are two examples.

(12) a. Sam built the house.
b. Samantha ate a sandwich.

Jackendoff represents the verb *build* with a structure that distinguishes an inner event:

(13) Sam built the house out of bricks.

[CAUSE ([SAM], GOcomp+ ([HOUSE], [FROM [BRICKS]]))]
Jackendoff 1990, p. 121, example 56a.

In (12), one of the arguments of CAUSE is the GO event, representing the creation of a house (from bricks). The feature comp+ on the GO predicate indicates that this is an event of composition where the entire house is involved. The incremental theme verbs share with the change of state verbs the existence of a distinguishable inner event involving some change in the direct object.

A third class of verbs with identifiable core events are the verbs of motion to a goal. The goal may be introduced either through the direct object (14) or through a PP (15):

(14) Bill ran a mile.

(15) Bill walked to the station.

Jackendoff 1990 unifies the verbs of motion to a goal with the preceding classes through use of the GO predicate. (16) shows Jackendoff's Conceptual Structure for *run:*

[11] The distinction between incremental theme verbs and change of state verbs is not an absolute one. Some verbs such as *fill* or *melt* could be understood either as incremental theme verbs or change of state verbs.

(16) John ran into the room

$[_{\text{Event}}$ GO $_{([\text{Thing}}$ JOHN], lb Path IN $_{([\text{Thing}}$ ROOM])])])]
(Jackendoff 1990, p. **45,** example 2)

Jackendoff also includes the verb *put* among the verbs that employ the GO predicate in their Conceptual Structure. The following is Jackendoff's entry for the verb *put*. (The representation has been simplified for the sake of presentation.)

(17) $[_{\text{Event}}$ CAUSE ($_{[\text{Thing}}$], $[_{\text{Event}}$ GO $_{([\text{Thing}}$], $[_{\text{Path}}$ TO $_{([\text{Place}}$])])])]
(from Jackendoff 1990, p. 80, example **34)**

These examples show that the lexical semantic literature gives some precedent for treating four verb classes in some unified fashion, as having some inner event including a change in the direct object and a final state obtaining of that direct object. I will refer to this inner event as a core event, in this paper. These four verb classes are: change of state verbs, incremental theme verbs, verbs of motion to a goal, and verbs of putting. I will treat these four verb classes **as** having core events in the subsequent paper.

To represent core events in this paper, I adopt a version of the logical semantics for English developed in Parsons 1990. Parsons develops a semantics of English in which he adopts elements of Dowty's 1979 aspect calculus and Davidson's 1967 quantification over events. Parsons refers to his approach **as** subatomic semantics, because it represents the events described by verbs as complex, having internal structure. Parson represents *x closes the door* **as:**

(18) (3e) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & [illegible] &
CAUSE(e,e') & (3s) [Being-closed(s) & Theme(s,door) & Hold(s)
& [illegible]
Parsons (1990) p. 120.

In Parsons' logical forms we see the ingredients of an inner event argument (e'), a BECOME predicate, and a state argument (s). The predicates Cul and Hold represent the aspectual properties of telicity and atelicity respectively, and allow the logical representation to capture the endstate entailments introduced by these verbs. The inner event *e'* is the change in the theme (or direct object) door, and the state *s* is the state holding of the door at the end of the closing event.[12]

[12]The range **of** verbs for which Parsons uses this kind of representation involving inner events is larger than the class **of** verbs with core events **as** I identify and describe in this paper. I refer here to core events only **as** including necessary endstates, while Parsons uses inner events to also represent verbs that do not involve any

7.3.2 Measure in the Semantic Literature

A verb whose lexical semantics permits or specifies a core event in its lexical semantic event structure, may also have an event structure with a measure or path component. If it contains a measure or path, the final state for the core event is a gradable predicate, admitting degree modification. These are matters little discussed (as yet) in the lexical semantics tradition; more relevant work may be found in the formal semantics literature. The semantics of gradable predicates invokes some notion of degree or measure, and has been examined in the context of comparatives (See Cresswell 1976 and Klein 1991 for some discussion of comparatives. See Klein 1997 on degree adverbs, and Bartsch 1976 on adverbs with a grading function.)

The measure adverbs are adverbs of measurement or degree that modify the endstate of the core event in the verb's lexical meaning. For example, given the truth of the sentence Sam closed the door partway or Sam partly closed the door, we understand that there was an event of the door closing partway, or partly closing (a core event), such that the endstate entailment holds of the door that afterwards it was partway closed. Parsons represents the logical form for a sentence like this as follows:

(19) Measure reading for change of state verbs:
X closes the door partway
X partly closes the door

(∃e) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & Theme(e',door) & CAUSE(e,e') & (3s) [Being-partway(closed)(s) & Theme(s,door) & Hold(s) & [illegible]

Parsons 1990, p. 122.

The adverb partway in Parsons' representation modifies the endstate *closed*, so that "partway closed is formed by applying the functor 'partway' to 'closed', yielding 'partway(closed)'" (Parsons 1990, p. 122). The adverb partway actually modifies into the core event, altering the endstate entailed of the object. I will call this reading the measure reading, and adverbs that yield this reading, measure adverbs.

7.3.3 Diagnosing Verbs with Core Events

The grammatical reality of a core event for verbs such as those discussed in the previous section has been recognized in the lexical semantics literature,

endstates. For example (Parsons 1990 p. 118) uses an inner event e' in the semantics associated with the verb *fly*, which has no necessary endstate and therefore no core event:

i.Mary flew her kite behind the museum
(∃e) [Agent(e,Mary) & (∃e')[Flying(e') & Theme(e',kite) & Behind(___,museum) & CAUSE(e,e')]]
(where the blank may be filled by either e or e')

as shown by the representations above. There are several ways we can see in the language, the grammatical reality of this core event. I will discuss two: the first having to do with transitivity alternations, and the second having to do with aspectual properties and endstate entailments. These are necessary but not sufficient conditions for the diagnosis of a core event, since there are many intersecting factors that affect lexical usages.

One of the motivations for representing this core event as having grammatical reality in this literature comes from the study of transitivity alternations, some of the most well-studied phenomena in the lexical semantics literature. In the causative/inchoative alternation and the middle alternation, we see verbs which may be used transitively, and also used in a sentence without the agentive subject, where their subject is the object of the related transitive sentence. In these usages, the verb is used to mean only the core event. The causative/inchoative alternation is illustrated in (20) and the middle alternation is illustrated in (22). It is a necessary condition, for this kind of transitivity alternation to be possible with a verb, that the verb have a distinguishable inner event in its lexical semantic representation.

The causative/inchoative alternation is illustrated in (20) below. Many change of state verbs (and verbal expressions) can appear alternately in causative or in inchoative sentences:

(20) a. Margot darkened the photograph.
b. The photograph darkened over time.

c. Three teenagers swept the floor clean in record time.
d. The floor swept clean in record time.

e. The cook thinned the gravy.
f. The gravy thinned.

The causative/inchoative alternation is quite productive (though not perfectly so[13]). The existence of this alternation shows that the causer,

[13]The existence of another verb with the inchoative meaning might block the alternation, e.g.:

i. Lorin killed the chicken. / *The chicken killed. / The chicken died.
ii. The doctor cured her patient. / *The patient cured. / The patient recovered.

For some change of state verbs, other factors may reduce the felicitousness of the causative/inchoative alternation. In the case of clean the alternation becomes possible when a particle is added enforcing the change of state reading:

iii. Johnson cleaned the wall.
*The wall cleaned.

and the caused inchoative event, must be separable in some way for these verbs. The events represented by the causative verbs in the (13a) sentences must be linguistically decomposable into at least the events represented by the inchoative verbs in the (13b) sentences. The set of possible syntactic frames these verbs may be used in supports their analysis as representing complex events including a distinguishable inner core event. Not all verbs enter into the causative/inchoative alternation, but it has been suggested that a complex event including this kind of core event is necessary in the verb's lexical representation for this type of alternation to be possible. The change of state verbs contain CAUSE and BECOME in their lexical representations, and they enter into the causative/inchoative alternation.

The class of incremental theme verbs does not enter into exactly the same range of syntactic structures **as** do the change of state verbs. (21) demonstrates that the verb *build* (unlike *darken* etc.) can only be used transitively:

(21) Sam built the house out of bricks.
*The house built out of bricks.

Although the incremental theme verbs differ from the change of state verbs in not entering into the causative/inchoative alternation, some of the verbs in this class enter into the middle alternation as in (22). (Unlike inchoatives, middles denote properties rather than events.)

(22) ...the soup that eats like a meal...
(?*Frank Lloyd Wright houses don't build easily.)

It is a necessary (though not sufficient) condition that verbs have a distinguishable core event in their lexical semantic representation in order to enter into a transitivity alternation where they may be used inchoatively or used **as** middles.

Verbs with core events are also distinguished by their aspectual properties. The core event, **as** expressed in these various representations, includes a 'becoming,' into a terminal state that holds of the direct object. That final state makes the verb telic, supplying a definite endpoint to the temporal extent of the event represented by the verb. The verbs with core events are precisely those with necessary temporal endstates associated with some change in their direct object. Therefore with these verbs there is an associated entailment that some state holds of the object at the end of the event. Telicity is therefore a necessary but not sufficient condition for verbs with core events.

One indicator of the aspectual property of finite temporal duration of events is the felicity of adverbial expressions denoting finite temporal duration of an event; e.g. *in ten minutes.* These were discussed by Vendler 1967

That muddy wall cleaned **up** nicely.

and Dowty 1979, and numerous others. Together with an endstate entailment, this is diagnostic of a change of state in direct object that indicates the existence of a core event. These conditions are true of the examples below:

(23) Three teenagers swept the floor clean in ten minutes.
After that the floor was clean.

The cook thinned the gravy in only thirty seconds.
After that the gravy was thin.

Sam built the house out of bricks.
After that the house was complete.

Samantha ate a sandwich.
After that the sandwich was completely consumed.

Verbs of motion to a goal do not enter into the same range of transitivity alternations.[14] Transitivity alterations such as the causative/inchoative of the middle do not apply in English in any case, where there is a PP instead of a direct object. With a direct object, the lack of referentiality of the path direct object hinders the applicability of these alternations (e.g.; ***??A** mile ran easily **for** John when he was in good condition.*).[15]

However, they clearly show aspectual properties associated with the core event. In (24a) the direct object provides a measure of the event, a spatial path coinciding with a temporal path of the event. In (24b) we see an endstate entailment:

(24) a. John ran a mile in ten minutes.
b. ??After that the mile was completely run.

(25a) contains an implicit path *(to the drugstore)* over which the event is measured out. In (25b) we see an endstate entailment:

(25) a. John walked to the drugstore in 10 minutes.
b. After that John was at the drugstore.

Finally, verbs of putting are analyzed as verbs with core events, since they can provide an endstate entailment of a change from an old to a new location:

[14] See Tenny 1995b for discussion of the similarities and differences between verbs of motion to a goal and the change of state and incremental theme verbs.

[15] See Tenny 1995a for more discussion of the role of referentiality in the argument/adjunct distinction.

(26) Jessie put the book on the table.
After that the book was on the table.
(*Books put easily on tables.)

7.3.4 Diagnosing Verbs with a Measure or Path

Among verbs with core events, we find a fundamental difference between those which have some element of a measure or path within their lexical semantics and those which do not. The change of state verbs, incremental theme verbs, and verbs of motion to a goal share with the verbs of putting the property of having a core event; but they also contain a measure or a path within their lexical semantics, while the verbs of putting do not. A measure or path yields a gradable progression through the event, by virtue of an implicit or explicit path or measure associated with the direct object.[16] This gradable progression can be illuminated by various kinds of modification. In (27) through **(30)** below the verb *run,* which has a path, is compared to the verb *put,* which has no path. The existence of a path can be teased out in several ways. Measure adverbs like *partway* are applicable to the path associated with *run,* but not with *put:*

(27) a. Jessie ran partway to the drugstore.
b. *Jessie put the book partway on the table. [in the path-measure reading]

In (27a) Jessie is understood to have traversed part of the distance to the drugstore. But in (27b) the book is not understood to have gone part of the distance towards the table. The location associated with the endstate may be indicated by *run to,* but not *put to:*

(28) Jessie ran **to** the drugstore.
*Jessie put the book **to** the table.

The path may be modified with *all the way* for *run* but not for *put:*

(29) Jessie ran **all the way** to the drugstore.
*Jessie put the book **all the way** to the table.

The rate of traversal along the path may be modified with a rate adverbial such as *slowly:*

(30) a. Jessie ran **slowly** to the drugstore.
b. *Jessie put the book **slowly** on the table. [in the path-measure reading]

[16] See Tenny 1994 for more discussion of measuring and the role of the direct object in measuring.

(30a) is ambiguous (as pointed out by Travis 1988), between a sense in which Jessie's movements or body motions were slow, and a sense in which her traversal of the distance to the drugstore was at a slow rate. (30b) does not have this ambiguity, and does not provide a specific, discrete meaning that the distance between the book's origin and the table was traversed at a slow rate.

The examples above illustrate a distinction between verbs having core events with a measure or path, and verbs having core events without a measure or path.

7.3.5 Diagnosing Verbs without Core Events: verbs of contact, psych verbs, and perception verbs

All the verbs discussed thus far contain a core event in their lexical semantics. By way of contrast, I will compare these verbs with three classes of verbs that are without a comparable core event. (My purpose here is not to exhaustively categorize all verb classes with or without core events; my purpose is rather to show that the distinction exists and focus on the nature of core events.) First, consider verbs of contact such as *hit* and *touch* (Fillmore 1967, and Tenny to appear). These verbs have no incremental theme or necessary change of state in their meaning, and they have no causative component to their meaning. If Mary hits the softball, she does not necessarily cause the softball to change in any way; one could even hit the softball without its moving anywhere. These verbs do not represent grammatically complex events. Consequently, an inner event cannot be grammatically separated from the general event described by the verb; either through the causative/inchoative alternation or by use of the middle construction:

(31) Mary hit the softball.
*The softball hit.
*This softball hits easily with a metal bat.

John touched the fabric.
*The fabric touched.
*That fabric touches like a dream.

Verbs of psychological state with experiencer subjects such as *know* or *love;* and verbs of perception such as see and *hear* likewise have no incremental theme or necessary change of state in their meaning, and they have no causative component to their meaning. The inchoative and middle alternations are not possible with these verbs. (Only the middles are shown for brevity):

(32) Oleg knows algebra very well. This is not surprising, because * algebra knows easily.

Marilyn is the sweetest person I know. Everybody loves her.
*Marilyn loves easily. [in the sense that Marilyn is easy for people to love]

Hale-Bopp (the comet) is now in the evening sky and can be seen easily by the naked eye.
*Hale-Bopp sees easily.

You can hear the trains go by late at night from up on the hill.
*The trains hear easily late at night from up on the hill.

Furthermore, these verbs are not telic. They are not felicitous with phrases of temporal duration such as *in five minutes.* The perception verbs in **(33)** are not telic, in the reading where the temporal duration provides a frame for the duration of the event. Where the psych verbs in **(26)** might be felicitous with phrases of temporal duration, the reader may ascertain that this is not because of telicity resulting from an endstate entailment that holds of the direct object:

(33) *We saw the comet Hale-Bopp (the comet) in the evening sky in five minutes. [in the temporal frame reading]
*We heard the trains in five minutes. [in the temporal frame reading]

(34) ?Oleg knew algebra very well in three months.
??Everybody loved Marilyn in five minutes.

The contrasts between verbs with core events (change of state verbs, incremental theme verbs, verbs of motion to a goal, and verbs of putting) and verbs of contact, psych verbs, and perception verbs on the other hand, which do not have core events, illustrate some of the reasons for treating core events in lexical semantic representation as having grammatical reality.

7.3.6 Three Verb Classes

To summarize the preceding sections, we have the following three verb classes:

Verbs with core events and a measure or path:

change of state verbs:

melt, die, close the door, cure the patient, fill the glass
incremental theme verbs: *eat a sandwich, build a house*
verbs of motion to a goal: *run a mile, run to the drugstore*

Verbs with core events but no measure or path:

verbs of putting: *put the book on the table, set the bowl* on *the shelf*

Verbs without core events:

verbs of contact: *kick, touch, hit*
stative psych verbs: *love, know*
perception verbs: *hear, see*

I take these to be verb classes in the sense of Levin **1993.** These classes are taken to have grammatical reality, to govern much of the syntactic behavior of their members, and to provide clear diagnostics for membership. In the next three sections, these classes will be used as diagnostics for the interaction of adverbs with the event structure elements of core event or measure.

7.4 Measure Adverbs: Modifying the Endstate.

7.4.1 The Measure Reading

The measure adverbs, introduced in section **3.2,** are adverbs of measurement or degree which modify the endstate of the core event in the verb's lexical meaning. Parsons' logical form for a sentence like *Sam closed the door partway* or *Sam partly closed the door* is repeated below from (19), as **(35):**

(35) Measure reading for change of state verbs:
X closes the door partway
X partly closes the door

(3e) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & Theme(e',door) & CAUSE(e,e') & (3s)[Being-partway(closed)(s) & Theme(s,door) & Hold(s) & BECOME(e',s)]]].
Parsons **1990,** p. **122.**

The measure adverbs modify into the core event. Two types of measure adverbs are available in English; they may occur before the verb **(36)** or after the verb **(37):**

(36) *measure adverbs: partly, half, completely, thoroughly, mostly*

John partly closed the door.
Roger half filled the glass.
The doctor completely cured the patient.
Nancy thoroughly mixed the paint.
Nicolas mostly filled the glass.

(37) *measure adverbs: partway, halfway, completely, thoroughly, most of the way*

John closed the door partway.
Roger filled the glass halfway.
The doctor cured the patient completely.
Nancy mixed the paint thoroughly.
Nicolas filled the glass most of the way.

The measure reading is possible.with incremental theme verbs as well. Following Parsons' treatment of change of state verbs, we can represent the measure reading for incremental theme verbs as in **(38).** Here the endstate is the degree of consumption or creation of the object (or the degree to which the direct object exists), represented below as degree of consumption of an implicit or explicit path:

(38) Measure reading for incremental theme verbs:
X eats the sandwich partway
X partly eats the sandwich.

(∃e) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & Theme(e', sandwich)
& CAUSE(e,e') & (3s) [Being-partway(consumed)(s)
& Theme(s,sandwich) & Hold(s) & BECOME(e',s)]]].

With verbs of motion to a goal, the path along which the motion proceeds can be considered a type of incremental theme.[17] These are repre-

[17] A significant difference emerges between the change of state verbs on the one hand, and the incremental theme verbs and verbs of motion to a goal on the other hand, in the way that the measurable quality is associated with the direct object. For the incremental theme verbs and verbs of motion, the endstate is the degree of consumption or creation of the object (or the degree to which the direct object exists), or the path traveled. The measurable quality is a kind of quantity (volume, mass, distance, etc.) associated with

sented similarly. These paths can be introduced through the object NP

the direct object **(or** an implicit path). For the change of state verbs, the endstate is the degree to which a property or quality holds of the object. Because the direct object plays this measure role, incremental theme verbs and verbs of motion to a goal seem to demonstrate a parallel between the measure reading introduced by the adverb and another reading introduced by a modifier inside the object NP. To illustrate using the adverb/quantifier *half,* the examples in (ii) seem at first blush to be nothing other than rather more natural versions of the sentences in (i):

i. a. Jane ate the sandwich halfway.
   b. Michael half built the house.
   c. The little child partly drank the bottle of beer (before he could be stopped).
   d. Someone mostly used up the bucket of paint.

ii. a. Jane ate half the sandwich.
   b. Michael built half the house.
   c. The little child drank part of the bottle of beer (before he could be stopped).
   d. Someone used up most of the bucket of paint.

If Jane ate the sandwich halfway, we can infer that afterwards half the sandwich was eaten or consumed, and half the sandwich remained in existence. This looks like a parallel reading to the measure reading expressed in (i) above. However, the parallel breaks down when we look at the change of state verbs, and we see that the sentences in (ii) are in fact quite different sentences from those in (i). Change of state verbs like those in (iii) take on a totally different meaning, often a bizarre one (consider *The doctor* cured *half the patient),* when *half* is inside the direct object:

i. Roger half filled the glass.
   The doctor half cured the patient,
   Nancy half melted the candle.

ii. Roger filled half the glass.
   The doctor cured half the patient.
   Nancy melted half the candle.

These examples show clearly the difference in meaning between preverbal *half,* and *half* when it occurs inside the direct object. Even though the two uses can have very similar or even identical truth conditions they differ significantly. In fact, whereas preverbal *half* is a modifier of the endstate in the core event, when inside the object noun phrase *half* operates as a narrow scope modifier within that noun phrase. In a Parsonian representation:

i. *X fill half the glass*

(∃e) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & Theme(e',half-glass) & CAUSE(e,e') & (3s) [Being-filled(s)
& Theme(s,**half-glass**) & Hold(s) & BECOME(e', s)]]]]

ii. *X* cure *half the patient*
∃e) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & Theme(e',half-patient) & CAUSE(e,e') & (3s) [Being-cured(s)
& Theme(s,**half-patient**) & Hold(s) & BECOME(e', s)]]]]

(39), or through a PP (40):[18]

(39) *X runs a mile partway*
X ??partly runs a mile

(∃e) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & Theme(e', mile) & CAUSE(e,e') &
(3s) [redacted] & Theme(s,mile) & Hold(s) &

(40) *X runs to the drugstore partway*

(∃e) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & Theme(e', path-to-drugstore) &
CAUSE(e,e') & (3s)[redacted] & Theme(s,path-to-drugstore) &
Hold(s) & BECOME(e',s)]]].

The measure adverb measures out the distance or progress made through the event by modifying the endstate, yielding a degree to which the event is completed. If we look more closely at the measure reading for these adverbs, we see that it requires a gradable object or path, as well as the gradable property of the endstate. For incremental theme verbs and change of state verbs, the gradable property holds of the (referent of) the direct object, and for the motion to a goal verbs, the gradable property holds of the path traversed. In each case the object or the path is translated into a measure of the event. It is through the direct object or the path that the core event may be thought of as being measured-out (Tenny 1994, Tenny 1995b).

7.4.2 The Measure Reading and the Three Verb Classes

The measure reading is possible with verbs with core events and a measure or path (with some lexical variation):

(41) *Verbs with core events and a measure or path:*

The shift in meaning between sentences with preverbal *half* and sentences with *half* in the direct object, in the case of some change of state verbs like *cure*, is quite pronounced, whereas the shift with an incremental theme verb such as *eat* is less radical. This is due to the difference in the gradable property which underlies the measuring-out of the event, for these two types of verbs. For incremental verbs like *eat,* the entity to which the head of the direct object refers increases or decreases in size (mass, bulk), and the measuring scale is determined directly on the basis of that gross change. So, when there is half an apple left, then (other things being equal) the halfway point on the measuring scale relative to an event of eating the apple will also have been reached. Not so with a cure: the increase or decrease in bulk of a patient is totally irrelevant to a measuring-out scale for an event of curing.

[18] See Tenny 1995a for further discussion of paths, measure, and motion verbs.

a. Jill partly closed the door.
a' Jill closed the door partway.
b. Maggie partly filled the glass.
b' Maggie filled the glass partway.
c. The ice cream sandwich partly melted.
c' The ice cream sandwich melted partway.
d. Sarah partly cured the patient.
d' ?Sarah cured the patient partway.
e. Martha partly ate the sandwich.
e' Martha ate the sandwich partway.
f. ?Jane partly ran a mile.
f' Jane ran a mile partway.
g. *Marge partly ran to the drugstore.
g' Marge ran to the drugstore partway.

The measure reading is not possible with verbs with core events and no measure or path **(39);** or with verbs with no core events **(42):**

(42) *Verbs with* core *events but no measure* or *path:*
a. *David partly put the book on the table.
a' *David put the book on the table partway.
b. *Max partly set the bowl on the floor.
b' *Max set the bowl on the floor partway.

(43) *Verbs without core events:*
a, *Bob partly kicked the wall.
a' *Bob kicked the wall partway.
b. *Dizzie partly touched the fabric.
b' *Dizzie touched the fabric partway.
c. *Michael partly loves music.
c' *Michael loves music partway.
d. *Ned partly knows algebra.
d' *Ned knows algebra partway.
e. *Nancy partly heard the cows.
e' *Nancy heard the cows partway.

Examples **(41)** through **(43)** show that the measure adverbs require both a core event and a measure component in the event structure of the verb they are associated with.

7.4.3 A 'messing-around' Reading

There is another reading available for some of the preverbal measure adverbs (particularly *half)* which must be teased away from the measure reading. Sentences like those in (41a–g) can sometimes be construed in a way which I will call the 'messing around' reading, following Tenny and Heny 1993. To see this reading, consider first sentences containing verbs without core events, **as** in (44). This reading is the only one available for sentences like these:

(44) a. Billy half knew the truth, but didn't want to admit it to himself.
b. Jimmy half heard the Beethoven Quartet, while he was thinking of what he would tell his boss.
c. Sue half liked the answer she received.

In these examples, the word *half* composes with the verb alone to yield a notion 'half-know' or 'half-hear' **(as** in half listen). In particular, *half* does not interact with a measure or path here, for these verbs *know* and *hear* contain no core event and no endstate and consequently no measure in their lexical semantics. For example, the verb *know* does not compose with *the truth* in (44a) to yield an interpretation with an endstate in which the degree of truth-knowing achieved is exactly half. Similarly for (44b), there is no endstate entailment in which the degree of quartet-hearing achieved is exactly half. Nor does either sentence yield an incremental-theme type measure reading, in which Billy knows exactly half of the truth, or Jimmy has heard exactly half of the quartet.

Instead, in such sentences, there is sometimes an implication that the actor is not seriously engaged in carrying out the action in question; in other words the actor is 'messing around'. In the sentence *Jimmy half heard the Beethoven quartet, half* serves to indicate that Jimmy was not payihg attention to the music, was, perhaps, 'messing around', or only half-listening while doing something else.

Sentences with verbs containing core events can also yield a messing around reading, with either change of state verbs or incremental theme verbs, with preverbal *half.* Construed in this way, *Nancy half melted the candle* yields a meaning in which rather than the candle being melted to the point where half of it was in a totally melted state, instead, some or all of the candle was somewhat melted, or on the way to becoming molten. This reading again seems to result from the preverbal modifier *half* acting **as** a pure verb modifier. Likewise with the sentence *The doctor half cured her patient,* there is a messing-around interpretation available in which we understand that the doctor did a sloppy job of curing her patient.

In the messing-around reading the adverb does not modify the core event. It supplies commentary on the manner employed by the agent in

carrying out whatever activity is named by the verb. Since the messing around reading is associated only with the preverbal adverbs, and since it does not require the existence of a core event, while the postverbal adverbs do, the preverbal version of the measure adverbs is available for verbs without core events, where the postverbal version is not available. Postverbal *partway* and *halfway* are purely modifiers of the scale implicit in the endstate; in fact they appear to be able to import a measuring scale and terminus into the semantics. The post-verbal versions of the measure adverbs only take the measure reading, and as such are purer in function than the preverbal versions.

7.4.4 The Syntactic Distribution of Measure Adverbs

Measure adverbs are VP-adverbs (in the traditional sense of VP), as **(45)–(48)** shows. *Partly,* etc., occurs VP-initially **(45)**, and *partway,* etc., occurs VP-finally or VP-internally (46).[19]

(45) *partly/half (completely, thoroughly, mostly)*

a. ***Partly/Half**, Roger will have [$_{VP}$ filled the glass by noon].

b. *Roger **partly/half** will have [$_{VP}$ filled the glass by noon].

c. *Roger will **partly/half** have [$_{VP}$ filled the glass by noon].

d. Roger will have [$_{VP}$ **partly/half** filled the glass by noon].

e. *Roger will have [$_{VP}$ filled the glass **partly/half** by noon].

(46) *partway/halfway (completely, thoroughly, most of the way)*

a. ***Partway/halfway**, Roger will have [$_{VP}$ filled the glass by noon].

b. *Roger **partway/halfway** will have [$_{VP}$ filled the glass by noon].

c. *Roger will **partway/halfway** have [$_{VP}$ filled the glass by noon].

d. ?*Roger will have [$_{VP}$ **partway/halfway** filled the glass by noon].

[19] Tom **Ernst has pointed out to me that the presence of an auxiliary can block sentence-initial VP adverbs:**

i. **a. Quietly, he turned to his companion.**

b. *Quietly, he must turn to his companion.

(Ernst, p.c.)

However, for these adverbs, the sentence-initial position is impossible even without an auxiliary:

i. *Partly/half/partway/halfway **Roger has filled the glass.**

e. Roger will have [$_{VP}$ filled the glass **partway/halfway** by noon].

The measure adverbs also show considerable lexical and individual speaker variation in acceptability, depending on the verbs and the preverbal or postverbal versions of the measure adverbs used. (The lexical variability is somewhat less pronounced for the postverbal measure adverbs than for the preverbal ones.) This kind of lexical variability is more likely to be found where the adverb is compositionally closer to the verb itself, than in adverbs that operate at a higher level. (We shall see later that this is not the case with the *almost* adverbs.)

(47) Sam partly / half / ?mostly / completely / ?thoroughly closed the door.
Jill ?partly / ?half / ?mostly / ?completely / ?thoroughly ran a mile.
Midge ?partly / ?mostly / ?completely / ?thoroughly ran to the drugstore halfway.

(48) Roger filled the glass partway / halfway / most of the way / completely / ?thoroughly.
The doctor cured the patient ?partway / ?halfway / ?most of the way / ?completely / ?thoroughly.
Midge ran to the drugstore partway / halfway / ?most of the way / ?completely / ?thoroughly.

These facts are consistent with a scenario in which the measure adverbs are syntactically and semantically close to the lexical verb.[20]

[20] Measure adverbs permit only distributive and not collective readings: (i), (iiia); in contrast to almost and again , which will be discussed in sections **5** and 6, and which permit collective readings: (ii), (iiib,c). (See Moltmann 1990, Tenny and Heny **1993)**

i. *Mary partly filled ten glasses.
Afterwards there were ten glasses each partly full.
Afterwards there were five glasses full and five empty.

ii. Mary almost filled ten glasses.
Afterwards there were ten glasses each almost full.
Afterwards there were nine glasses full and one empty.

iii. Verbs with 'collective' arguments: (gather, accumulate, meet)
a. *John partly gathered his ten brothers and sisters together.
b. John gathered his ten brothers and sisters together again for the event.
c. John almost gathered his ten brothers and sisters together.

Since measure adverbs are not scope taking, ten must take higher scope than partly. This suggests that the semantics of measure is 'below' that of cardinality.

7.5 The Restitutive Reading: Taking Scope Over the Endstate.

7.5.1 The Restitutive Reading

Next we will consider adverbs such as again in its restitutive reading. The restitutive reading represents a return to a preexisting state (Von Stechow 1995, Dowty 1979, and others). In the examples below, for the restitutive reading it is not necessary that the door was opened by anyone before, just that it once was in an open state.

(49) John opened the door again.
The door opened again.

Von Stechow 1995, following Dowty 1979, represents the restitutive reading as follows:

(50) a. The door opened again.
b. PAST (ˆ**again** (ˆ[BECOME (ˆ[open (d)])])]) (repetitive/ external reading)
c. PAST (^BECOME(ˆ [**again** (ˆ[open (d)])])]) (restitutive/ internal reading)
Von Stechow 1995, following Dowty 1979

The restitutive reading, in contrast to the measure reading, is scope-taking. Where the measure reading modifies internal to the endstate of the core event, the restitutive reading takes scope over the endstate of the core event.

7.5.2 The Restitutive Reading and the three Verb Classes

The restitutive reading is possible with verbs with core events, as long as pragmatic considerations or world knowledge do not interfere (see 51c,e), and you have a referential object (see 51f). It does not care whether or not there is a measure or path (52), and it is not possible with verbs without core events (53).

(51) **Verbs with core events and a measure or path:**
a. Jill closed the door again.
b. Maggie filled the glass again
c. ?The ice cream sandwich melted again.
d. Sarah cured the patient again.
e. *Martha ate the sandwich again. [in the restitutive reading of again]
f. *Jane ran a mile again. [in the restitutive reading of again]

g. Marge ran to the drugstore again. (Marge ran back to the drugstore.)

(52) **Verbs with core events but no measure or path:**

a. David put the book on the table again. (David put the book back on the table.)

b. Max set the bowl on the floor again. (Max set the bowl back on the floor.)

(53) **Verbs without core events:**

a. *Bob kicked the wall again. [in the restitutive reading of again]

b. *Dizzie touched the fabric again.

c. *Michael loves music again.

d. *Ned knows algebra again.

e. *Nancy heard the cows again.

Note that although examples (53a-e) are possible sentences, they do not permit a restitutive reading of again. For example, a restitutive reading of (53a) would mean something like: 'Bob has not kicked the wall before, but the wall has been touched by his boot before, and now it is again.' Examples (51) through (53) show that restitutive again requires only a core event in the event structure of the verb it is associated with. It does not care whether or not there is a measure component present in the event structure.

7.5.3 The Syntactic Distribution of the Restitutive Adverbs

Restitutive again is a VP adverb (in the traditional sense), like the measure adverbs. It must occur after the verb for the inner scope restitutive reading, as (54) shows (Von Stechow 1995, Dowty 1979). These sentences are ungrammatical specifcially in the restitutive reading of again:

(54) a. ***Again,** Roger will have [$_{VP}$ filled the glass by noon].

b. *Roger **again** will have [$_{VP}$ filled the glass by noon].

c. *Roger will **again** have [$_{VP}$ filled the glass by noon].

d. *Roger will have [$_{VP}$ **again** filled the glass by noon].

e. Roger will have [$_{VP}$ filled the glass **again** by noon].

When we compare the distribution of measure adverbs and restitutive again, we find that restitutive again must follow a measure adverb.

(55) Roger filled the glass partway again.
Roger filled the glass again partway. [in the restitutive reading of again]

So restitutive *again* is a VP adverb, like the measure adverbs, but occurs syntactically outside of the measure adverbs.[21]

7.6 False Ambiguity: Vagueness Masquerading as Scope Over the Endstate.

7.6.1 The *almost* Reading

There is a well-known apparent ambiguity associated with adverbs like *almost* and *nearly*, discussed since the days of generative semantics (Morgan 1969) that seems to yield a reading with scope over the endstate in the core event, like that for restitutive *again*. The sentences below can be understood in either of the two ways in (56–57a) or (56–57b). The (b) readings seem to demonstrate apparent scope over the endstate:

(56) John almost filled the glass.

a. John almost started to fill the glass, but for some reason he did not do so.

b. The glass was almost full after John was done.

John nearly built his house.

a. John nearly set about building his house, but for some reason had to abandon his house-building plans.

b. The house was nearly completely built when John was forced to stop for some reason.

I will argue that *almost* is not in fact ambiguous, contrary to the tradition of literature that says it is. I will argue that the (b) readings are not in fact, the same as measure readings or restitutive readings. I will argue that they are merely one possible way to understand a single vague reading. Consider first, the occurrence of *almost* and *nearly* with the three different verb classes.

7.6.2 The *almost* Reading and the three Verb Classes

An apparent inner scope reading for *almost* is possible with verbs with core events (57) and (58), as we would expect:

[21] The question arises as to why preverbal *partly* is possible, but preverbal restitutive *again* is not:

i. Roger will have [$_{VP}$ **partly/half** filled the glass by noon]. (repeated from 45d)

ii. *Roger will have [$_{VP}$ **again** filled the glass by noon]. (repeated from 54d)

I do not have a complete answer at this point. However, two possible sources for the answer come to mind. First, the preverbal *partly* adverbs may be engaging in a kind of lexical semantic composition with the verb that is not possible for restitutive *again*, for whatever reason. Second, the answer may be related to whatever accounts for the freer distribution of manner adverbials than restitutive *again*. Restitutive *again* is highly syntactically constrained compared to other adverb classes.

(57) Verbs with core events and a measure or path:

a. Jill almost closed the door.
b. Maggie almost filled the glass.
c. The ice cream sandwich almost melted.
d. Sarah almost cured the patient.
e. Martha almost ate the sandwich.
f. Jane almost ran a mile.
g. Marge almost ran to the drugstore.

(58) Verbs with core events but no measure or path:

h. David almost put the book on the table.
i. Max almost set the bowl on the floor.

However, in contrast to the restitutive and measure adverbs, *almost* might seem to have scopal ambiguities under some interpretations, with verbs without core events:

(59) Verbs without core events:

a. Bob almost kicked the wall.
b. Dizzie almost touched the fabric.
c. Michael almost loves music.
d. Ned almost knows algebra.
e. Nancy almost heard the cows.
f. William almost saw Comet Hale-Bopp, but it was too low on the horizon from his latitude.
g. We almost heard the Julliard String Quartet, but we got lost on the way to the concert hall.
h. The child almost touched the hot stove, but her mother snatched her away.
i. Jenny almost hit the ball, but she swung too soon.

For example, we might understand *Bob almost kicked the wall* to be ambiguous between Bob's getting ready to kick the wall, but abandoning the project, and Bob's starting to kick the wall but not quite connecting or reaching it. However, as we have seen above, the lexical semantic representation of the verb *kick* does not contain a core event with an endstate, for *almost* to take scope over. If *almost* were truly offering an ambiguity in scope over the core event, we should expect it to discriminate between verbs with and without core events, in the same way that restitutive *again* does.

On closer examination we can see that *almost* offers many possible 'readings', limited only by the imagination of the speaker. For example, a

stative sentence such as *Michael almost loves music* might be understood to mean: Michael *likes* music a lot, but doesn't quite *love* it; Michael loves some music, but not enough to constitute loving music; Michael can't quite bring himself to love music, but with a slight push he might; and so on. *Nancy almost heard the* cows might be understood to mean: Nancy tried very hard, but couldn't hear the cows, and if she'd tried a little harder, she would have heard them; Nancy heard the sheep but not the cows; Nancy heard some noise, but not enough to be sure it was cows; Nancy passed by just before the cows made noise, and if she'd been a little later, she would have heard them; and so on. In contrast to the measure reading associated with adverbs like *partly, almost* allows a 'near approach' from any direction, whereas the measure reading assumes that some of the event in question was completed. (It permits a near approach only from a direction specified through the event structure.) *Almost,* unlike *partly* or *partway,* seems to quantify freely over almost anything, so to speak. This suggests that *almost* is not scopally ambiguous, but is simply vague; and in the apparent scopally ambiguous readings it is simply picking out salient interpretations offered by the existence of a core event in the lexical semantics.

Note that also, in contrast to the measure adverbs (and to a lesser extent restitutive *again),* the *almost* adverbs show virtually no lexical variability. This shows that the *almost* adverbs indeed have quite different semantic properties from the measure adverbs:

(60) Sam nearly/almost/just about closed the door.
Roger nearly/almost/just about filled the glass.
The doctor nearly/almost/just about cured the patient.
Nancy nearly/almost/just about mixed the paint.
Janice nearly/almost/just about ate the sandwich.
Mark nearly/almost/just about built the house.
Jill nearly/almost/just about ran a mile.
Midge nearly/almost/just about ran to the fence.

These facts argue that the *almost* class of adverbs must be distinguished semantically from the measure class of adverbs.

7.6.3 The Syntactic Distribution of *almost* and *nearly*

Almost and *nearly* clearly belong to Jackendoff's special class of focusing adverbs. They occur outside of the (traditional) **VP,** occupying **AUX** or INFL position **(60):**

(61) *nearly/almost (just about)*

a. ***Nearly/almost**, Roger will have **[VP** filled the glass by noon].

b. ?Roger **nearly/almost** will have [$_{VP}$ filled the glass by noon].

c. Roger will **nearly/almost** have [$_{VP}$ filled the glass by noon].

d. Roger will have **nearly/almost** [$_{VP}$ filled the glass by noon].

e. *Roger will have [$_{VP}$ filled the glass **nearly/almost** by noon].

These facts support the conclusion that the *almost* adverbs are syntactically and semantically, compositionally farther out from the verb than the restitutive and the measure adverbs. Far enough out, in fact, to be quite independent of the lexical verb.[22]

7.7 Adverbs and Semantic Zones

The following distinctions between the three adverb classes have been outlined in the previous sections:

(i) The measure adverbs, syntactically VP adverbs in the traditional sense, must co-occur with a verb which has a measure or path in its lexical semantics. Semantically the measure adverbs do not take scope over the endstate of the core event, but participate in the composition of the endstate.

(ii) The restitutive adverb *again* co-occurs with verbs having core events, regardless of whether or not they contain a measure element. Restitutive adverbs take scope over the endstate of the core event. **As** such, they are outside of the semantic composition of the measure or path. These are also VP adverbs in the traditional sense; however they are outside of, or farther from the verb than the measure adverbs.

(iii) The *almost* adverbs do not participate in the composition of the core event, or take scope over the endstate. The endstate is not visible to them. Syntactically they are INFL adverbs, well outside of the core event and the traditional VP.

In this section we examine how these facts about the three adverb classes can be set in the context of semantics/syntax mapping, as mediated by event structure. I will advocate a limited correspondence between semantic zones of composition and syntactic categories.

7.7.1 Semantic Zones and Functional Projections

With the advent of minimalism (Chomsky **1995)** and the proliferation of functional categories, recent work in generative syntax has seen much discussion of functional projections in phrase structure. However, there has been less attention paid to the nature of the features underlying these pro-

[22] Distinctions have been made in the literature between lexical and syntactic versions of operations such as nominalization, passivization, or compounding, in which the syntactic version of an operation shows clear and regular semantic compositionality, while the lexical version does not. (For an interesting discussion see Grimshaw 1990 on syntactic nominalizations.) Taking the syntactic/lexical distinction not to be an absolute but a fuzzy divide, the examples in (60) provide additional circumstantial (though not conclusive) evidence that almost is 'farther out' ' into the syntax' than the measure adverbs.

jections. They are generally assumed to be diagnosable by their morpho-syntactic effects. This makes eminent sense, as these are semantic features assumed to have morpho-syntactic import. However, it is also often assumed that functional projections have some kind of clear and distinct functional meaning, and labels of proposed functional projections do not always convey that clearly. Adverbs raise the question of what makes something a possible functional projection more insistently, since the apparent syntactic hierarchy of adverbs seems to reflect a hierarchy of functional projections. The approach developed by Cinque 1997 promises to balloon the inventory of functional categories as various adverb classes receive their own projections. I will propose here that the relationship of adverbs to functional projections should be defined in terms of the semantic zones of composition to which the adverbs belong. These semantic zones are defined syntactically on a hierarchy of functional projections constituting a kind of extended event structure. Each semantic zone supplies one functional projection. This approach reduces the load of a somewhat arbitrary inventory of functional projections, and makes the idea of features in syntax more coherent, while retaining the important insights of Cinque's work.

To consider what semantic zones of composition are instantiated in a sentence, I begin with Cinque's (1997) universal hierarchy of clausal and functional projections, which is based on an extensive cross-linguistic compilation and analysis of adverb distribution. I will show how we can think of it in terms of semantic zones instead. I will also attempt to integrate some other recent work on functional categories into a general sketch of the functional projections of the clause to which the distribution of adverbs may relate. Finally, I will discuss the place of our three adverb classes in that view. The patient reader is warned that this proposal will of necessity be a sketch, a blueprint for a research direction, leaving much to be tested, worked out, or possibly revised in future research. Many relevant points will not be addressed. I beg the reader's indulgence as I raise more questions than I settle.

Cinque's universal hierarchy of clausal and functional projections is laid out below in **(62).** (Cinque 1997, p. 178). Under Cinque's system each square bracket indicates a separate functional projection, and the adverbs are specifiers of that projection.[23]

[23] The syntactic ordering of adverbs in the clause upon which Cinque bases this hierarchy is based on the unmoved ordering of adverbs, where the moved or non-basic order can be ascertained by a pause or comma intonation.

(62) [*frankly* $\text{Mood}_{speechact}$ [*fortunately* $\text{Mood}_{evaluative}$ [*allegedly* $\text{Mood}_{evidential}$ [*probably* $\text{Mod}_{epistemic}$ [*once* T(Past) [*then* T(Future) [*perhaps* $\text{Mood}_{irrealis}$ [*necessarily* $\text{Mod}_{necessity}$ [*possibly* $\text{Mod}_{possibility}$ [*willingly* $\text{Mod}_{volitional}$ [*inevitably* $\text{Mod}_{obligation}$ [*cleverly* $\text{Mod}_{ability/permission}$ [*usually* $\text{Asp}_{habitual}$ [*again* $\text{Asp}_{repetitive(I)}$ [*often* [$\text{Asp}_{frequentative(I)}$ [*quickly* $\text{Asp}_{celerative(I)}$ [*already* T(anterior) [*no longer* $\text{Asp}_{terminative}$ [*still* $\text{Asp}_{continuative}$ [*always* $\text{Asp}_{perfect(?)}$ [*just* $\text{Asp}_{retrospective}$ [*soon* $\text{Asp}_{proximative}$ [*briefly* $\text{Asp}_{durative}$ [*characteristically(?)* $\text{Asp}_{generic/progressive}$ [*almost* $\text{Asp}_{prospective}$ [*completely* $\text{Asp}_{SgCompletive(I)}$ [*tutto* $\text{Asp}_{PlCompletive}$ [*well* Voice [*fast/early* $\text{Asp}_{celerative(II)}$ [*completely* $\text{Asp}_{SgCompletive(II)}$ [*again* $\text{Asp}_{repetitive(II)}$ [*often* $\text{Asp}_{frequentative(II)}$

As a first pass at identifying the relevant semantic zones of composition, Cinque's universal hierarchy may be grouped into semantic zones, as follows:

(63)

point of view (speaker deixis)	[*frankly* $\text{Mood}_{speechact}$ [*fortunately* $\text{Mood}_{evaluative}$ [*allegedly* $\text{Mood}_{evidential}$ [*probably* $\text{Mod}_{epistemic}$
deictic time (temporal deixis)	[*once* T(Past) [*then* T(Future)
truth value	[*perhaps* $\text{Mood}_{irrealis}$ [*necessarily* $\text{Mod}_{necessity}$ [*possibly* $\text{Mod}_{possibility}$
subject-oriented	[*willingly* $\text{Mod}_{volitional}$ [*inevitably* $\text{Mod}_{obligation}$ [*cleverly* $\text{Mod}_{ability/permission}$
middle aspect	[*usually* $\text{Asp}_{habitual}$ [*again* $\text{Asp}_{repetitive(I)}$ [*often* $\text{Asp}_{frequentative(I)}$ [*quickly* $\text{Asp}_{celerative(I)}$ [*already* T(anterior) [*no longer* $\text{Asp}_{terminative}$ [*still* $\text{Asp}_{continuative}$ [*always* $\text{Asp}_{perfect(?)}$ [*just* $\text{Asp}_{retrospective}$ [*soon* $\text{Asp}_{proximative}$ [*briefly* $\text{Asp}_{durative}$ [*characteristically(?)* $\text{Asp}_{generic/progressive}$ [*almost* $\text{Asp}_{prospective}$
core event	[*completely* $\text{Asp}_{SgCompletive(I)}$ [*tutto* $\text{Asp}_{PlCompletive}$ [*well* Voice [*fast/early* $\text{Asp}_{celerative(II)}$ [*completely* $\text{Asp}_{SgCompletive(II)}$ [*again* $\text{Asp}_{repetitive(II)}$ [*often* $\text{Asp}_{frequentative(II)}$

Six zones may be identified by certain distinguishing semantic characteristics. Each zone has something in its semantics not found in the zone below it, and as semantic units are composed in the clause, they become available to semantic composition higher up. The proposal is that each of the semantic zones corresponds to a functional projection in syntax. I embark

only on an intuitive discussion below of these zones, in order to sketch out the proposal.

7.7.2 The Upper Semantic Zones

The top three zones consist of two zones of modality, with tense in between. Modality is separated into two syntactic categories: point of view modality and truth value modality. The top 'point of view' zone contains those mood or modality elements that necessarily introduce the point of view of the speaker, and therefore also introduce the speaker as a sentient, deictic argument. We cannot have a point of view without a sentient being to hold it. A speech act, of course, necessarily involves the speaker as a participant. An evaluative expression, at the sentence level, reflects the point of view of the speaker. Evidentiality involves the speaker **as** a sentient perceiver; a proposition that is *apparently* true or false must be so to someone. Finally, epistemic modality, which addresses a state of knowledge of something, must involve a sentient mind that is in the state of knowing; at the sentence level it is the speaker who is represented **as** holding that knowledge. The next zone, 'deictic time', introduces reference to some time related to the time of utterance — what we traditionally think of **as** tense. Tense has been generally accepted as a functional projection in its own right, since Pollock **1989.** The third zone, labeled 'truth value', contains three types of mood or modality that, according to Cinque, occur syntactically below tense: irrealis, necessity, and possibility. These invoke a simple truth value independent of the speaker, one not expressly involving the speaker's point of view. Under the view advocated here, the higher classes of adverbs in the Cinque hierarchy are base-generated in functional projections associated with one of these three semantic zones. Instead of nine individual projections for such things as speech act, epistemic, past, irrealis, and so on, we have these three projections for these semantic zones.

The split of modality into two parts, motivated by the distribution of adverbs, raises questions about mood that should be further pursued (although I will not do so here). Mood Phrases have been proposed by Rivero **1994** and Pollock **1997** (among others); however these authors do not divide mood into two parts separated by deictic time. Alexiadou **1997** distinguishes speaker-oriented adverbs from modal adverbs, observing that they can co-occur in Greek, and that the speaker-oriented adverbs are higher in the clause.[24] Tenny **1998** argues (from binding facts) that the point of view level of modality should be considered a distinct level with syntactic import, which could give further support for a projection of speaker deixis. Rizzi **1997** proposes that the CP be split into an (illocutionary) Force and a Finiteness projection, which could suggest a similar separation of modal-

[24] However, **Alexiadou places the speaker-oriented adverbs within a Relative Phrase projection.**

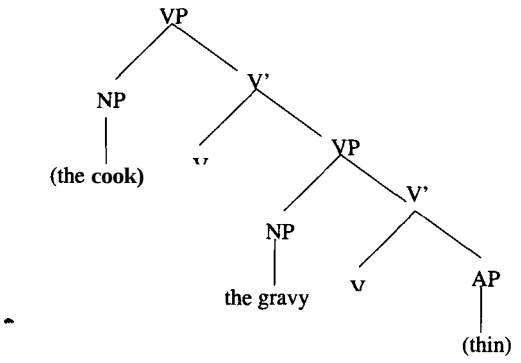
ity into two parts. At any rate, Cinque's hierarchy of adverb distribution suggests that the mood projection should be decomposed into two parts.

Some other higher projections that have been proposed in the literature, such as projections for Topic and Focus inside the CP (Rizzi **1997)** seem, at this writing, to have less relation to adverb distribution (apart from the effects of adverb preposing or fronting, which I will not address). Also the AGR projection does not play a role in the Cinque hierarchy or the semantic zones derived from them. It is not apparent to this author how AGR might relate to adverbial meanings.[25]

7.7.3 The Lower Semantic Zones

To consider how the lower three semantic zones of composition are projected in syntax, we turn to proposals for the decomposition of the traditional VP into an upper and lower VP. Travis (this volume) outlines the idea in detail and elucidates its history. This decomposition is illustrated in **(64)** below, repeated from **(10)** in section **3.1:**

(64) The cook thinned the gravy:



Hale and Keyser **1993,** p. **72,** example **31.**

The upper VP is a projection of the causative part of the verb meaning, represented by CAUSE, with the agent in specifier position; and the lower VP represents the core event **(as** discussed in section **3.1).** The upper VP, which introduces agentive and causative material, is the projection with which agent-oriented adverbs (such as *cleverly* and *willingly* in their agent-oriented usages), must be associated. These adverbs are found in the subject-oriented semantic zone of the Cinque hierarchy.[26]

[25] See **Alexiadou 1997, however, who tentatively places subject-oriented adverbs in the AgrS projection.**

[26] Cinque **acknowledges in his ms. that he has not fully addressed the question** of subject- **vs. agent-oriented adverbs. Also, some** of **the adverbs in the subject-oriented**

The lower VP represents the core event. Under the view advocated here, we regard this VP as the zone where the semantic composition of the core event takes place, and which encompasses all morpho-syntactic elements participating in that composition, including the composition of the endstate. Cinque's (1997) cross-linguistic generalizations, and Alexiadou's (1997) analysis of the Greek facts, both place aspectual adverbs like *completely* below other aspectual adverbs or morphology.[27] Travis (this volume), working from the facts in Western Malayo-Polynesian, also distinguishes between an inner and outer aspect, where the inner aspect has to do with the endstate.

What I have called the middle aspect zone in the Cinque hierarchy contains elements that look not into the core event, but modify the time span the event consumes or occupies, or quantify over the core event.[28] It sees the core event in its entirety rather than participating in its composition. I suggest here that the semantic composition of the core event results in the semantic representation of a span of time that can be modified or quantified over, and it is in fact this kind of semantic operation that takes place in the middle aspect zone. Restitutive *again* belongs in this zone; it takes scope over the core event represented by the lower VP, but does not take scope over the agentive causing event represented by the higher VP. In fact, restitutive *again* occurs syntactically below agentive *cleverly*. Only (65a) can have the restitutive reading of *again*. In (65b), where *cleverly* is closer to the verb than *again*, the restitutive reading of *again* is impossible.

(65) a. Bob closed the window again cleverly.

b. *Bob closed the window cleverly again. [in the restitutive reading of *again]*

group may occur lower in the hierarchy (Cinque, p.c.). When this is worked out in his system, the place of subject- and agent-oriented adverbs in the hierarchy will presumably become clearer; and this category may turn out to be more than one category.

[27] Cinque's SgCompletive(I) and PlCompletive projections reflect a difference in distributivity. Where there is a plural object, the Plural Completive means that the entire set represented by the object has been totally affected, and the Singular Completive means that each member of the set has been totally affected. It is not clear what *se*mantic difference, if any, obtains between the SgCompletive(I) and the SgCompletive(II) in the Cinque hierarchy.

[28] Tom Ernst has pointed out to me that some temporal and quantificational adverbs can have freer ordering than suggested by their place in the Cinque hierarchy:

(i) She already has willingly contributed to the cause.

(ii) Usually they would then return to base.

(iii) We found that quite often/each year the artifacts had probably been disturbed.

Ernst (p.c.)

It must first be established that there is no focus, comma intonation. or other indication that these adverbs are moved from a more basic position. If these adverbs are in fact base-generated in these positions, then it may be the case that adverbs may be generated above their respective semantic zones, but not below them.

Alexiadou 1997 finds the same general facts for Greek, where Greek 'cleverly' occurs above aspect.[29]

We have a distinction between aspectual adverbs above the core event level, which can take scope over the core event; and aspectual adverbs within the core event, which can participate in its composition. Restitutive *again* belongs to the first, *completely* belongs to the second. In Cinque's hierarchy we see a split between upper and lower celerative, repetitive, and frequentative projections. The upper (I) projections modify the event as a whole, while the lower projections (11) modify internally to the core event. In Cinque's words (Cinque 1997, p. 158, fn. 45):

> ...this suggests the existence of two distinct quantificational 'spaces'; one involving quantification over events, located just below modals, and comprising the habitual, repetitive (I) and frequentative (I) aspects; the other involving quantification over the predicate, comprising the repetitive (II) and frequentative (11) aspects. A comparable distinction will be made for 'quickly/rapidly' (and the so-called celerative aspect).

The two-way distinction in rate adverbials discussed by Travis (see example **4)** is accommodated in this fashion. However, a three-way distinction may in fact be necessary, to include the usage where the adverb is simply a manner adverbial. The manner/rate ambiguity can be drawn out in the right context, and is illustrated in (66), although the pure manner reading is odd:

(66) Kazuko moved quickly to the window.

a. pure manner modification:
   Kazuko moved her body in quick motions while progressing to the window, although her traversal of the path to the window may not have been a fast one.

b. modification internal to the core event (true rate modification):
   Kazuko's traversal of the path to the window was fast.

Adverbs like English ***quickly*** may be able to modify in three semantic zones—in the middle aspect, subject-oriented, and core event zones—although other languages might use different lexical items for these different levels of modification.

[29] **Aspect Phrases have been proposed by Travis (this volume), who places the Aspect Phrase between the two VP projections; and by Laenzlinger 1993 and 1996 and Borer 1994, who place the Aspect Phrase above a single VP and below the Tense or IP projections. See also Sanz1996 for an interesting approach dividing the work of aspect between a Transitivity Phrase and an Aktionsart Phrase.**

The upper and lower repetitive and frequentative projections in Cinque's hierarchy raise more questions. From Cinque's discussion, it would appear that the lower projections (11) should quantify over the core event. However, Cinque places these projections below the completives — an ordering not reflected in this study of English *completely* and restitutive *again.* I leave this matter unresolved.[30]

I have so far discussed the split between the aspectual material inside the lower VP and aspectual material between the two VPs. Aspect may in fact need to be divided into three parts; besides the aspectual material in the core event, and the level of aspect between upper and lower VP, there may be a top level of aspect located above the upper VP, corresponding to Travis' outer aspect (this volume). Laenzlinger 1996 also postulates a division between an upper aspect projection associated with the IP system, and a lower aspect projection associated with the VP domain. These several different levels of aspect may be instantiated in some of the Slavic languages (see Filip this volume for discussion of some complex aspectual morphology in Slavic), and I tentatively include it in the set of functional projections proposed here, labeled as higher aspect.[31] Adverbs of quantification such as those discussed by Swart 1993 may also belong in this category. In a Parsonian representation (see example (18)), higher aspect contains material that modifies the time span associated with (e), and middle aspect contains material that modifies the time span associated with (e'). This set of functional projections distinguishing two VPs and two aspect projections gives a more articulated structure to aspect.

Two other possible semantic zones that I do not employ here are worth mentioning: a Voice Phrase (Kratzer 1994), which Cinque 1997 and Alexiadou 1997 use for adverbs like *well;* and a projection exclusively representing the stative predicate that comprises the endstate of the core event (e.g., the AP *thin* in Hale and Keyser's example (64)). These two kinds of projections would subdivide the lower VP; whether they do I leave that as an open question, and will not include them here.

[30] But I have two suggestions for possible resolutions: (i) the location of these projections is suggested somewhat tentatively by Cinque, in large part on the basis of morphological information. These morpheme orderings might have arisen in languages where the mirror principle is not reflected, or the morpheme ordering was altered in some way from the semantic ordering. (ii) Repetitive adverbs like English *again* can take a variety of different scopes. These adverbs might therefore turn up in a variety of syntactic slots, and in some cases it might be difficult to ascertain whether the adverb is strictly a restitutive.

[31] Some of the subject-oriented material in the Cinque hierarchy may actually be lower in the hierarchy (Cinque p.c.). This possibility taken together with the split into higher and middle aspect, may rearrange some material in the two aspect zones and the subject-oriented zone.

7.7.4 Where do *almost* and *nearly Go?*

A projection for *almost/nearly* does not appear in the Cinque hierarchy. Cinque's category *[almost* $\text{Asp}_{prospective}$] is something else: a strictly temporal *almost* meaning 'bejust about to do something'. The usage of *almost* focused on in this paper is not distinguished. Where do *almost* and *nearly* belong in the hierarchy of semantic zones and functional projections? These adverbs belong to the class originally described by Jackendoff **1972 as** restricted to AUX position, and having to do with focus and presupposition. The English sentential negation *not* has a similar distribution. **(67)** is repeated below **as (68):**

(67) a. ***Nearly/almost**, Roger will have [$_{VP}$ filled the glass by noon].
b. ?Roger **nearly/almost** will have [$_{VP}$ filled the glass by noon].
c. Roger will **nearly/almost** have [$_{VP}$ filled the glass by noon].
d. Roger will have **nearly/almost** [$_{VP}$ filled the glass by noon].
e. *Roger will have [$_{VP}$ filled the glass **nearly/almost** by noon].

(68) a. ***Not** Roger will have [$_{VP}$ filled the glass by noon].
b. *Roger **not** will have [$_{VP}$ filled the glass by noon].
c. Roger will **not** have [$_{VP}$ filled the glass by noon].
d. Roger will have **not** [$_{VP}$ filled the glass by noon].
e. *Roger will have [$_{VP}$ filled the glass **not** by noon].

Almost and *nearly* have a negative component to their meaning as well, **as** we see when we try to contradict the non-completion of the event. **(69)** is odd:

(69) ??John almost closed the door, and then the door was closed.

Almost and *not* can be unordered with respect to each other, and they can take relative scope with respect to each other, **as** long **as** they are in the same general INFL area:

(70) a. Roger will **almost not** have [$_{VP}$ filled the glass by noon].
b. Roger will **not almost** have [$_{VP}$ filled the glass by noon].
c. Roger will have **almost not** [$_{VP}$ filled the glass by noon].
d. Roger will have **not almost** [$_{VP}$ filled the glass by noon].

The fact that *almost* and *not* are located syntactically within the same area of the clause and they share a common element of meaning suggests that *almost, nearly* and sentential *not* should be integrated into a common semantic zone.[32] However, other adverbs in the same 'AUX' class

[32] Negation **Phrases have been proposed by a number of authors (Laka 1990, Zanuttini 1991). Zanuttini 1991 argues that negation may appear at more than one level of**

mentioned by Jackendoff include *merely, virtually, hardly, scarcely, utterly* —a list which includes some adverbs that do not appear to have the same negative sense as *almost* and *nearly*. Jackendoff **1972** commented on the kinship between negation and focus/presupposition, noting that negation can interact with focus so that the negation relates to either the focus or the presupposition.[33] I will call the functional projection hosting the *almost/ nearly* adverbs the Lower Focus projection. Thus we have another Focus projection lower down in the clause, in addition to the focus projection proposed for the top of the clause within a subdivided CP (Rizzi **1997).** The formal semantics of *almost/ nearly* are not addressed in this paper, but this approach predicts that clues to the proper treatment of these adverbs should come from their kinship with other adverbs in the same focus zone.

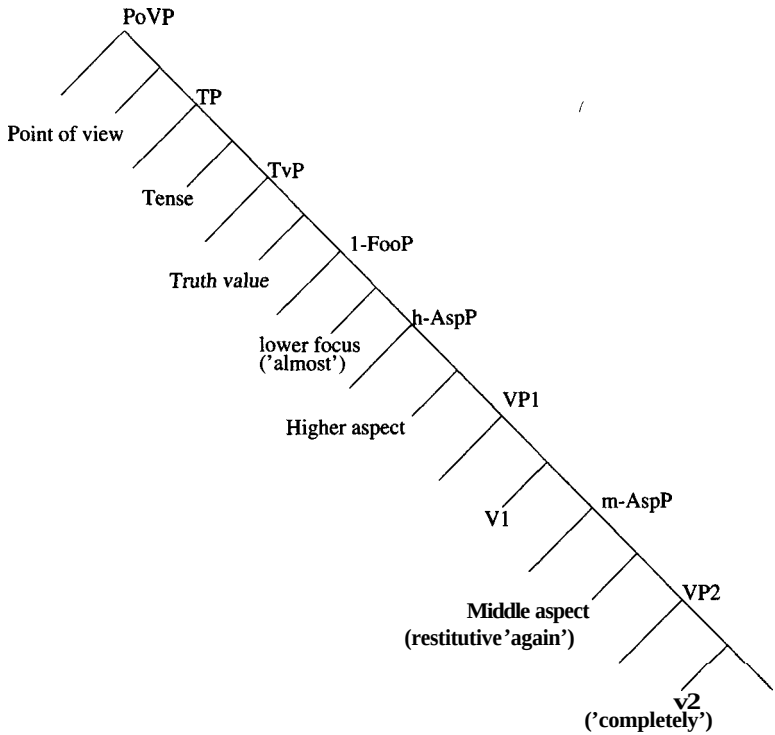
7.7.5 A Big Picture

Here is a summary compilation of the functional projections and semantic zones that interact with adverbs, which I have argued for in **6.1–6.3.** The three adverb classes are annotated under the projections they are associated with. Since my main focus here is on the functional projections themselves, I leave the matter of how these adverbs appear within these projections open — whether they are specifiers, adjuncts or something else.

functional projection. This makes eminent sense under the approach advocated here, and we have already seen this to be the case with other adverbs such as English *quickly* and *again*.

[33] **See also Konig 1991 and Rooth 1992 for more recent work** on **focus adverbs.**

(71)



I consider this series of functional projections an extended-event structure reflecting the general plan for the syntactic and semantic composition of the clause, which adverbs hook into. Lexical specifications for adverbs would specify what level or levels of this structure they can appear in. If there seems to be a fixed ordering of adverbs within the zones, this view predicts this is due to semantic convenience or necessity, rather than to the ordering of functional projections. I differ with Cinque here, in saying that only the semantic zones and functional projections in **(71)** are universally ordered.[34] Under this approach, semantic and syntactic composition is loosely parallel, hitched together at interface points which are the boundaries between functional projections.

As a first pass, a potentially falsifiable first hypothesis, I believe it is reasonable to assume that in general semantic material inside a lower zone of semantic composition is inaccessible to semantic operations at higher zones of composition. We can now return to the chart in (1), with the

[34]My **criticism of Cinque's work is in** no **way meant to detract from it, as I think the scope and reach of his work has opened up new avenues for exactly these kinds of questions. I intend these comments as contributions to, rather than dismissals of, Cinque's work.**

semantic zones of the three adverb classes appended:

(72)

adverb class	*measure/path*	*core event*	*semantic zone*
measure adverbs	**visible**	**visible**	**core event**
restitutive adverbs	**opaque**	**visible**	**middle aspect**
almost **adverbs**	**opaque**	**opaque**	**lower focus**

This is why the core event is opaque to many if not most kinds of adverbial modification. In spite of the special ability of measure adverbials to modify into the core event, there are many more adverbs that cannot do so. These include adverbials of time and place **(73)–(75)**, frequency adverbs (76), and speaker-oriented adverbs **(77).** Fodor **1970** demonstrated in his famous critique of generative semantics that time adverbs are not sensitive to the internal structure of complex events.

(73) Floyd caused the glass to melt on Sunday by heating it on Saturday.

*Floyd melted the glass on Sunday by heating it on Saturday.

Fodor **1970,** #17, **19.** pp. **432–433.**

(74) John caused Bill to die on Sunday by stabbing him on Saturday.

*John killed Bill on Sunday by stabbing him on Saturday.

Fodor **1970,** #20–21. p **434.**

Following Fodor, we can see that adverbs of place or location are also not sensitive to internal event structure, and do not modify the core event:

(75) John caused Bill to die in Memphis by stabbing him in Nashville.

*John killed Bill in Memphis by stabbing him in Nashville.

The core event is also opaque for the type of frequency adverbial in **(76)** below. The sentence below has only one of the two possible interpretations in (a) and (b).

(76) Jacob frequently closed the door.

a. Jacob frequently caused the door to close.

b. *Jacob caused the door to frequently close.

Speaker-oriented adverbs such as *evidently, probably,* and *certainly* are not sensitive to individual verbs or event structures. (Being sentence-level adverbs, they operate at the level of the entire proposition.) No ambiguity is available with the verb *kill.* Only the (a) reading is available below:[35]

[35] Interestingly, **with the speaker-oriented adverbs the ambiguity is not available even with cause** *to die:*

John evidently caused Bill to die.

a. It is evident that Bill died and John caused it.

b. *It is evident that Bill died (but not evident that Bill caused it).

(77) John evidently killed Bill.

a. It is evident that Bill died and John caused it.

b. *It is evident that Bill died (but not evident that Bill caused it).

As a final thought, the levels of functional projections and semantic zones in (71) demarcate the reach of other grammatical elements besides adverbs. The core event is also opaque for quantification. Consider (78) below. When quantifier scope is available, it is only available at the highest 'event level'; we do not get quantifier scope over the core event or over the endstate. It is not possible to get scope over the core event or over the endstate in sentences like the following:

(78) a. John closed every door.

b. John filled every glass.

c. John ran every mile.

By way of illustration, consider two possible relative scopes for the sentence *John filled* ***every glass.*** In (79), there is one event of glass-filling in which all the glasses are involved. In (80) there is a separate event of glass-filling for each glass. These are not the scopal ambiguities in question, **as** we will see:

(79) (∃e) (Vg) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & Theme(e',glass) & CAUSE(e,e') & (3s) [Being-filled(s) & Theme(s,glass) & Hold(s) &BECOME(e',s)]]].

(80) (Vg) (3e) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & Theme(e',glass) & CAUSE(e,e') & (3s) [Being-filled(s) & Theme(s,glass) & Hold(s) & BECOME(e',s)]]].

However, quantificational scope inside the top-level (e) is not possible (to my ear):

(81) a. *(∃e) [Cul(e) & Agent(e,x) & (∀g)(∃e')[Cul(e') & Theme(e',glass) & CAUSE(e,e') & (3s) [Being-filled(s) & Theme(s,glass) & Hold(s) & BECOME(e', s)]]]

b. *(∃e) [Cul(e) & Agent(e,x) & (∃e')[Cul(e') & Theme(e',glass) & CAUSE(e,e') & (∀g)(∃s) [Being-filled(s) & Theme(s,glass) & Hold(s) & BECOME(e', s)]]]

(81a) would have to mean that John did one thing (one causing event or one overall event) and this caused many events of glasses becoming full. Crucially, John's causing event would be separable from the core events of glass-fillings. **Or** in (81b), we would have to understand that John did one causing action, and there was one event of glass-filling, for which there

were many events of glasses reaching the point of fullness. Admittedly these judgments are subtle and rather confusing, but to my ear at least, they do not seem possible. If so, then the core event is opaque for quantification.

7.8 Summary

In brief: I have examined three classes of adverbs—the measure adverbs, restitutive adverbs, and *almost* adverbs—and shown that they interact with event structure in different ways. This has led to the proposal that the syntactic and semantic properties of these adverbs are organized through an event structure constituted of semantic zones hooked up with a small inventory of functional projections. I have sketched out an extended event structure for the clause; and I have proposed that it is through this structure that adverbs are organized into the syntactic and semantic composition of the clause.

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