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LOCALITY OF *Wh*-MOVEMENT AND THE INDIVIDUATION OF EVENTS

ROBERT TRUSWELL

Doctoral Dissertation
University College London

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Declaration

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Abstract

I propose a novel characterisation of the counterexamples to the generalisation that *wh*-movement out of an adjunct is impossible. The thesis discusses three classes of exceptions, namely extraction from in order clauses (1a), prepositional participial adjuncts (1b), and bare present participial adjuncts (1c).

- (1) a. What are you working so hard [in order to achieve *t*]?
b. Who did John go home [after talking to *t*]?
c. What did John drive Mary crazy [whistling *t*]?

These contrast with cases where extraction is impossible (2).

- (2) a. *What did you get upset [because Mary said *t*]?
b. *Who have you been really happy [since talking to *t*]?
c. *What does John work [whistling *t*]?

These two groups do not form natural syntactic classes, but are distinguishable in event-structural terms. The minimal constituent containing the head and foot of the chain in (1) describes a single event, on an appropriate definition of *event*, but does not in (2). Accordingly, I propose the following condition:

- (3) *Wh*-questions carry a presupposition that the minimal constituent containing the head and the foot of the chain describes a single event. *Wh*-movement is permitted only if the denotation of that minimal constituent can be construed accordingly.

Chapter 2 of the thesis develops a formal and cognitively well-motivated model of the internal structure of events. Key to this model is the recursively defined notion of *extended*

events, corresponding to plan formation. This recursion crucially allows (3) to capture long-distance A'-dependencies.

Chapter 3 applies this model, assuming (3), to locality data, deriving the contrast between (1) and (2), as well as other data such as the absolute prohibition on extraction from tensed adjuncts (2a), and the distinction between bridge verbs and factive islands (4).

- (4) a. What did John think [that Mary did *t*]?
b. * What did John regret [that Mary did *t*]?

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To be honest, I've been dreading writing these acknowledgements for a while now. Partly, this is because it has come to my attention that some people actually read acknowledgments (I thought I was the only one. . .). Mainly, though, it's because of the question of what to put in here. Not so much where to start, as when to stop. The thesis is only a couple of hundred pages long, and if the acknowledgements run to 50 pages, it would be a bit imbalanced. Also, the beginning of my time at UCL was a couple of years ago now, and I can't really remember it any more. I wish I'd kept notes on who to thank as I went along. But I didn't, and all I can do is apologise to anyone I've inadvertently left out.

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Chapter 1

Introduction

One of the key insights of Ross' (1967) seminal dissertation is that the conditions under which application of a given rule is *blocked* are at least as important as the conditions which permit a rule to apply. As Chomskyan linguistics has moved towards conceptions of syntax in which increasingly general operations, such as indexing and Move α in the GB era, or MERGE and AGREE in current minimalist approaches, enjoy great potential freedom of application, the structural factors which limit the *actual* application of these operations have come to assume an absolutely central role in the theory.

Ross presents a number of constraints on the application of transformational rules. The validity of the vast majority of these constraints has survived almost unchallenged to the present day, in itself a remarkable fact when the changeable nature of almost every other facet of syntactic theory is considered. However, this paper aims to re-examine one part of one such constraint. This is the theory of *islands* which he presents, and in particular the theory of adjunct islands, one of the two major subclasses of islands as originally defined, in English. Work in the research tradition initiated by Ross has generally assumed that adjuncts do not allow extraction of their subconstituents. This thesis hopes to demonstrate that, at least for English, this is simply false.¹ Examples such as (1) clearly demonstrate this.

¹In fact, it is not clear that Ross' proposal itself actually suffers from these shortcomings. The definition of *island* in Ross (1967) hinges crucially on S nodes, and while it is clear that *tensed* adjuncts contain S nodes, the issue is debatable for *untensed* adjuncts. Ross only directly rules out extraction from tensed adjuncts, then. As we shall see below, and as argued by Szabolcsi (2006), this prediction is correct. Whether extraction from untensed adjuncts is also prohibited on Ross' theory depends upon the analysis of their structure. Perhaps more importantly, a ban on extraction from any adjunct (in a syntactically defined sense) has come to be assumed in mainstream syntactic theory, as embodied in core works on locality such as Huang (1982), as well as minimalist reworkings such as Uriagereka (1999) and Johnson (2002). It is this prohibition which I hope to challenge here.

- (1) a. Whose attention is John waving his arms around [in order to attract t]?
b. What did John drive Mary crazy [whistling t]?
c. Who did John go home [without talking to t]?

Beyond the simple fact of the existence of legitimate cases of extraction out of adjuncts, however, investigation of the distribution of such cases raises a number of puzzles, including the following.

The Restricted Extraction Puzzle Some classes of verbal adjunct freely permit extraction of their complement. This is true, for example, of the *in order* clause illustrated in (1a). It appears that every felicitous declarative sentence containing an *in order* clause permits extraction of a referential DP complement of the verb in that clause. (2) gives some more examples.

- (2) a. What did you come round [in order to work on t]?
b. Which paper did John travel halfway round the world [in order to submit t]?
c. What did Christ die [in order to save us from t]?

However, other classes of adjunct impose surprising restrictions on subextraction. A case in point is the class of *bare present participial adjuncts* illustrated in (1b). To a first approximation (to be sharpened in section 3.2.4 below), subextraction from this class of adjunct is possible only if the adjunct describes an activity, and the matrix VP describes a telic event. (3) illustrates the first half of this claim,² while (4) demonstrates the second half.

²It is not possible to provide a full paradigm of aspectual classes here, as bare present participial adjuncts describing states or achievements are impossible even in declarative sentences, as in (i)-(ii) below.

- (i) *John drove Mary crazy [noticing the typo].
(ii) *John drove Mary crazy [knowing Georgian].

It is possible to object that bare present participial adjuncts describe an activity or accomplishment as a matter of definition, or in other words, that the morphosyntactic form of such adjuncts is incompatible with other aspectual classes. I agree to a large extent, as will become clear in chapter 3, but this approach still begs the question to a significant degree, given that embedding of a present participial adjunct under a preposition makes it possible to interpret the adjunct as belonging to one of the other aspectual classes, as in (iii) below, where the adjunct VP uncontroversially describes an achievement.

- (iii) John fell asleep before arriving at his destination.

- (3) a. **Adjunct describes an accomplishment:** ✗ What did John drive Mary crazy [building *t*]?³
- b. **Adjunct describes an activity:** What did John drive Mary crazy [whistling *t*]?
- (4) a. **Matrix VP describes an accomplishment:** What did John drive Mary crazy [whistling *t*]?
- b. **Matrix VP describes an achievement:** What did John arrive [whistling *t*]?
- c. **Matrix VP describes an activity:** * What does John work [whistling *t*]?
- d. **Matrix VP describes a state:** * Which magic hat does John know Georgian [wearing *t*]?

From a syntactic perspective, this is puzzling. Even given the existence of proposals, such as that of Ramchand (2006), to treat aspectual class membership in decompositional syntactic terms, there is no clear reason why such proposals should interact with locality theory to produce the patterns that we see here.

The Restricted Answers Puzzle The class of *prepositional participial adjuncts* illustrated in (1c) also imposes restrictions on when subextraction is possible, but these restrictions are rather distant from the aspectual class restrictions illustrated in the previous puzzle. Here, the restrictions concern the assumed *answer* to the question. Consider the dialogues in (5–6).

- (5) A: Which book did John design his garden [after reading *t*]?
 B: An introduction to landscape gardening.
- (6) A: Which book did John design his garden [after reading *t*]?
 B: # *Finnegans Wake*.

From a purely temporal point of view, it is equally plausible that John puts down his copy of either *Finnegans Wake*, or the introduction to landscape gardening, and gets to

³I use the ✗ sign to indicate ungrammaticality on an intended interpretation. As is generally the case with accomplishments, an activity reading is also possible for the adjunct here. The unavailable reading is one in which the adjunct is interpreted as an accomplishment, with an entailment that the building was completed.

work at the drawing board. However, the question asked by A seems to assume more than that. Clearly, the introduction to landscape gardening is connected to garden design in a way that *Finnegans Wake*, hopefully, is not. More specifically, reading the introduction to landscape gardening enables John to design his garden. Asking a question such as that in (5–6) apparently assumes some such connection, over and above the purely temporal relation specified by *after*.

Note, now, that this is linked not only to the fact that A's utterance is a question, but more specifically to the fact that the extraction site of the *wh*-phrase is contained within the adjunct. Compare the dialogues in (7–8). Once again, we see here a *wh*-question including a verbal *after* adjunct. In this case, however, extraction is of the complement of the *matrix* verb, so *wh*-movement bypasses the adjunct completely. In this case, there is no requirement for any specific connection between the events described in the matrix VP and the adjunct, and so both answers are equally acceptable.

(7) A: What did John do *t* [after reading the introduction to landscape gardening]?

B: He wrote an essay on *Finnegans Wake*.

(8) A: What did John do *t* [after reading the introduction to landscape gardening]?

B: He designed his garden.

Once again, this is quite unexpected from a syntactic perspective. There is no clear reason why the *after* which is extracted across in (5–6) should behave differently from the *after* which is bypassed by extraction in (7–8). More fundamentally, there is also no syntactic reason to expect the wellformedness of a *wh*-question to depend on the answer to that question.

The Interpretive Puzzle Consider again two examples discussed in the context of the restricted extraction puzzle:

(4) a. **Matrix VP describes an accomplishment:** What did John drive Mary crazy [whistling *t*]?

b. **Matrix VP describes an achievement:** What did John arrive [whistling *t*]?

Although both (4a) and (4b) are grammatical, there is a clear interpretive difference between the two. (4a) is most readily interpreted as in (9).

- (9) What is the x such that John whistling x caused Mary to go crazy?

However, (4b) *cannot* be interpreted as in (10a). Instead, the relation between matrix and adjunct events is purely temporal, more along the lines of (10b).⁴

- (10) a. What is the x such that John whistling x caused him to arrive?
 b. What is the x such that John was whistling x immediately before he arrived?

This data point alone does not immediately add to the desiderata of our theory of extraction from adjuncts, as these readings are also preferred in corresponding declaratives, as in (11).

- (11) a. John drove Mary crazy whistling hornpipes.
 b. John arrived whistling the *Marseillaise*.

However, other declaratives constructed from VPs of the same aspectual classes do not have these interpretations, and do not allow extraction either. For example, (12a) contains an bare present participial adjunct describing an activity and modifying a VP describing an accomplishment, in parallel with (11a). However, unlike that case, it is impossible to interpret the two events in (12a) as standing in a causal relation. Instead, the relation here is roughly one of simultaneity: John painted the picture *while*, but not *by*, eating apples. And when this causal relation is absent in this way, the possibility of extracting out of the adjunct disappears, as shown by (12b).

- (12) a. John painted this picture eating apples.
 b. *What did John paint this picture [eating t]?

A similar observation can be made in the achievement case. (13a) shows a case, parallel to (11b), in which an bare present participial adjunct describing an activity modifies a matrix VP describing an achievement. However, unlike the previous case, the relation between the

⁴This specific choice of paraphrase will be justified in section 3.2.4.

two events here cannot be one where the adjunct event immediately precedes the matrix event, as our world knowledge tells us that living room carpets are situated inside homes, and so John's arrival at his home must precede his dripping mud over the living room carpet. Once again, this difference in interpretation brings with it a difference in extraction possibilities. (13b) is pretty marginal in any case, but it is absolutely impossible if the answer is *the living room carpet*, a further effect of the sort discussed above under the heading of the *restricted answers puzzle*.

- (13) a. John came home dripping mud all over the living room carpet.
b. ??/* What did John come home [dripping mud on *t*]?

The interpretive puzzle can be broken down into two parts, then. Firstly, we hope to explain why the possibility of extraction from bare present participial adjuncts modifying VPs describing accomplishments and achievements is contingent on the interpretive relation between the two events. Secondly, we want to know why these two different aspectual classes single out different interpretive relations in the extraction cases. Once again, the current state of syntactic locality theory has little to say on the matter.

The Unlikely Antilocality Puzzle *Antilocality*, as the name suggests, is the opposite of locality. Whereas syntactic locality theory operates on the assumption that certain syntactic operations are impossible because they relate elements, or positions, that are structurally too distant from each other, antilocality theory claims that certain syntactic operations are impossible because they relate elements, or positions, that are structurally too close to each other. There are two prominent antilocality theories currently on offer. The first, due to Grohmann (2003), prohibits movement between certain subdomains of the clause. Meanwhile, the second, due to Abels (2003), prohibits movement between positions within a single projection.

Under certain circumstances, extraction out of bare present participial adjuncts also appears to exhibit antilocality effects. The examples in question are the following:

- (14) a. ?? What did John drive Mary crazy [fixing *t*]?
b. What did John drive Mary crazy [trying [to fix *t*]]?

Clearly, the grammatical (14b) contains more syntactic structure than the ungrammatical (14a), and so an antilocality approach to these data may initially seem promising. (14a) is ungrammatical, so the story would go, because *What* and its trace are simply too close.

However, several factors make this point of view a nonstarter. Firstly, note that replacing the adjunct verb in (14a) gives a fully grammatical sentence, as in (1b), repeated below, despite the absence of any obvious additional syntactic structure.⁵

(15) What did John drive Mary crazy [whistling *t*]?

Secondly, replacing the embedding verb in the adjunct in (14b) can lead to ungrammaticality, as in (16). Once more, this is unexpected on any putative antilocality approach: there is no clear sense in which *what* and its trace are any closer in (16) than in (14b), and so any antilocality theory will, once again, be at a loss to explain what's going on.

(16) *What did John drive Mary crazy [beginning [to fix *t*]]?

Finally, the antilocality effect, such as it is, disappears altogether in other syntactic environments. In (17), for example, the same participial constituents are subextracted from the PP complement of *talk*. In this environment, strikingly, both examples are well-formed.

(17) a. What did John talk [about [fixing *t*]]?

b. What did John talk [about [trying [to fix *t*]]]?

It seems, then, that the putative antilocality effect must be sensitive not only to the distance traversed by movement, but also to the local relations among nodes passed along the way. The presence of an adjunct boundary apparently induces an antilocality effect which is absent when the path from *t* to *what* passes no such boundary. Equally, certain lexical items apparently form barriers to movement, while other syntactically identical lexical items do not. It is clear that such an antilocality theory will lack the elegance and theoretical motivation of Grohmann's and Abels' proposals.

So the antilocality account of (14) has proven to be a straw man. But what else does syntactic theory have to offer in the face of such data? Antilocality aside, the unifying characteristic of syntactic locality theories is that intervening material can only make extraction

⁵Even on syntactic decompositional approaches such as Ramchand's, we would expect an activity verb such as *whistle* to contain fewer eventive projections than an accomplishment verb like *fix*, as activities have a less complex subevent structure. Syntactic decompositional approaches will not help here, then.

harder, not easier, as intervening material can only provide further barriers to extraction. This is the exact opposite of what we find here, where an adjunct allows extraction only in the presence of some such extra structure.

We have, then, four ways in which the pattern of admissible extractions out of adjuncts, in addition to the fact of their existence in the first place, is apparently quite at odds with what current syntactic theory would lead us to expect. However, I claim that all four, plus several other ramifications to be discussed below, can be predicted on the basis of a single condition. In its preliminary form, it is the following:

(18) Events form locality domains for *wh*-movement

Wh-questions carry a presupposition that the minimal constituent containing the head and the foot of the chain describes a single event. *Wh*-movement is permitted only if the denotation of that minimal constituent can be construed accordingly.

This condition operates on the assumption that events have a linguistic and cognitive reality parallel to that of regular individuals. What this means is that we expect the system of mereological and other relations among different events to be as rich as that which exists among other individuals (see Davidson 1967, 1969, Link 1983 and Bach 1986 for foundational work on this parallelism). Crucially for our purposes, an event can stand in a part-whole relation to another event. In other words, events do not come to our attention already neatly individuated, but rather, we package up the flow of stuff that happens into discrete events, and we may, under certain circumstances, do so at a coarser or a finer grain, with the result that a single event corresponds to more or less stuff that happens. (18) entails that, in the case of extraction out of a verbal adjunct, *wh*-movement is possible only if we are able to stretch the boundaries of what we consider as a single event sufficiently to cover the two *subevents* described by the matrix VP and the adjunct VP. It is clear, however, that such a flexible, pragmatically influenced conception of events is quite some way from the standard view of events in semantics (see Davidson 1967, Higginbotham 1985, Parsons 1990 and Kratzer 1996, among many others), according to which sentences denote properties of existentially quantified event variables, and little more needs to be said. Accordingly, chapter 2 is devoted to elaborating an explicit theory of what can, and what cannot, count as a single event, on grounds independent of *wh*-movement. We proceed in two steps. First, we define the notion of a *core event* in section 2.3, to cover the standard

decompositional treatment of Vendlerian aspectual classes (see Vendler 1957, Dowty 1979 and a host of subsequent authors). We then, in section 2.5, define an *extended event* as a chain of appropriately related core events, corresponding to the plan of the rational agent of the first event in the chain. The ability, or willingness, to construe a series of events as occurring according to the will of a rational agent therefore has a significant effect on the upper bound of possible event size, as extended event construal is only available if such an agent is acknowledged.

It is only in chapter 3, then, that we will return to the *wh*-question data, to test the predictions made by (18) in the light of the theory of event structure constructed in chapter 2. Given an intricate, partly pragmatically based, theory of event structure, we are able to make a series of intricate, partly pragmatically based predictions concerning extraction from adjuncts, making reference to the interaction of factors including the semantics of the element linking the matrix and adjunct VPs, agentivity, tense, attachment height, and relations of causation and plan formation. These predictions will be seen to be borne out.

This theory would lose plausibility, however, if it were only to cover cases of extraction from adjuncts. Section 3.3 shows that the domain of applicability of (18) is wider than this, however, by turning our attention to extraction out of complement clauses. We see, following the insight of Erteschik-Shir (1973), that a unifying characteristic of bridge verbs is that they are referentially opaque. In that case, a clause embedded under a bridge verb cannot be taken to entail the existence of an event independent of the event described by the matrix VP. This is in contrast to the class of factive islands, introduced by verbs which presuppose the truth of the proposition denoted by their complement. Accordingly, I argue that extraction from the complement of a factive verb, but not a bridge verb, always contravenes (18), in that the existence of two independent events is a necessary component of the semantics of the former, but not the latter, case.

We have, then, a fairly simple plan to test a fairly simple hypothesis embodied in (18). What distinguishes (18) from previous Chomskyan approaches to locality, of course, is that (18) is not syntactic. It is, in fact, a claim about the semantics and pragmatics of *wh*-questions. This surprising fact illustrates a methodological principle familiar from the earliest days of generative grammar. Chomsky has insisted from 1955 onwards that we have no way of determining *a priori* the cause of a deviant sentence's ill-formedness (for example, 'descriptions of particular subsystems of the grammar must be evaluated in terms

of the entire system of rules', Chomsky 1965:44). What we see here is a case where what appeared to be a syntactic fact, the islandhood of adjuncts, is in fact best described using the techniques, assumptions and vocabulary of semantics and pragmatics. The four puzzles given above are intended to illustrate the improbability of describing the adjunct subextraction data in purely syntactic terms. The rest of this thesis is given over to showing that semantic terms do a better job here.

Chapter 2

The Structure of Events

2.1 Introduction

A condition like (18) is only as much use as the theory of event structure to which it makes reference. The aim of this chapter is to elaborate such a theory. The classical semantic notion of *event*, associated first and foremost with Davidson (1967), is less concerned with the delimitations of individual events, than with the formal hypothesis that sentences denote properties of event variables. However, the question of the *individuation* of events was raised not long afterwards, firstly, to my knowledge, in Davidson (1969). In a nutshell, this is the question of how much, and how little, stuff that happens we are willing to consider as a single event.¹

The theory put forward here is one according to which there is no single answer to the question of the individuation of events. In much the same way as the portioning of matter into identifiable individuals is dependent on the coarseness of the grain with which we look at that matter, so the delimitations imposed on the flow of stuff that happens depend on the level of detail with which we look at what happens. This is the phenomenon referred to as *variable pragmatic coarse-graining* by Bittner (1999), and it will prove to be one major source of the flexibility in the individuation of events which forms the keystone of the project of relating locality of movement to event structure. Variable pragmatic coarse-graining is illustrated in section 2.2.

The fact that the size of the portions of stuff that happens which come to be parcelled up as individual events is variable does not, however, mean that anything goes. Section 2.2

¹In the interests of historical accuracy, it should be made clear that Davidson was primarily concerned with the question of when statements asserting the identity of two events were valid. The link to the questions of interest here, concerning the boundaries of individual events, can be made, but I won't go through this here.

will also show for the first time some clear cases where we are unwilling to admit that a particular portion of stuff that happens corresponds to a single event. We are then in a position to demonstrate the validity of a particular test for a single event, namely Fodor's (1970) distinction between lexical and periphrastic causatives. This leads on to a particular theory of the lexical aspectual classes, suggested or foreshadowed in various ways by researchers as diverse as Mourelatos (1978), Dowty (1979), Bach (1986), Verkuyl (1989), Parsons (1990) and Pustejovsky (1991).² According to this theory, the four aspectual classes of Vendler (1957) can be derived from the presence or absence of two subevents, a temporally extended *preparatory process* causing, and immediately preceding, a pointlike *culmination*. Seen from this perspective, then, the aspectual classes represent a lexically, or maybe grammatically, fixed instance of variable pragmatic coarse-graining. The existence of a lexical aspectual class consisting of a process and a culmination means that there are lexically encoded cases of multiple subevents corresponding to a single *macroevent*, to borrow a term from Ramchand (2006).³

This theory of lexical aspect, presented in section 2.3, is the point at which most semantic theories of event structure stop.⁴ However, this thesis aims to go beyond this point, and show that, under certain circumstances, sentences containing multiple verb phrases can also describe a single event. This is another cornerstone of the attempt to relate event structure and locality, as the existence of successive-cyclic movement would be unexplainable under (18) if VPs or clauses marked an upper bound on the size of a constituent describing a single event.

If this claim is correct, then multiple VPs, for example in an adjunction relation, may come to jointly describe a single event. Section 2.4 lays down the theoretical assumptions and empirical evidence motivating the claim that lumps of structure larger than a single VP can describe a single event. This essentially casts Fodor's generalisation, introduced in section 2.2, as a one-way implication. A lexical verb must describe a single event, but a single event is not necessarily described by a single verb phrase. More precisely, each VP

²We will also have reason to compare our approach to more structurally complex theories of lexical aspect presented in Moens and Steedman (1988) and Ramchand (2006), in the course of the thesis.

³I use the terms *macroevent* and *subevent* in a relational sense throughout this dissertation. An event is a macroevent iff it is composed of multiple events, and an event is a subevent iff it forms a proper part of a larger event. The same event may be a macroevent if its internal composition is considered, and a subevent if its external relation to other events is at issue.

⁴The same is not necessarily true of theories approaching event structure from other perspectives, such as cognitive science. I return to this below.

will always describe a single event, but multiple such events can be construed under certain circumstances as jointly constituting a single macroevent. The circumstances under which multiple VPs can jointly describe a single macroevent depend on the relations among the subevents described by the individual VPs. Specifically, the subevents can be considered as constituting a single macroevent only if they are related by one of the family of *contingent* relations discussed by Moens and Steedman (1988) and Wolff (2003), consisting of at least causation and a relation concerned with plan formation which will be called *enablement* in what follows.

Two primary factors affect the construal of subevents as contingently related. The first, in the case where two VPs are syntactically in an adjunction configuration, is the linking element (the preposition or phrase such as *in order to*) joining the two together. These elements specify some aspect of the relation between the events described in the relevant VPs. The second factor, however, is the participants in the dialogue, who may or may not enrich the information encoded in the utterance itself by positing a contingent relation among the subevents, even when the utterance contains no direct encoding of such a relation. This provides a place for real-world knowledge in the individuation of events. Moreover, in the presuppositional approach to *wh*-questions embodied by (18), this suggests that ease of accommodation of the presupposition that *wh*-questions relate to a single event will variably affect the acceptability of such questions.

As the size of individual events grows, however, the nature of the relations among the subevents which constitute them changes. At relatively low levels, corresponding to small portions of stuff that happens, the relations among subevents are exclusively causal. As the size of the macroevents increases, however, these relations come to be dominated by relations pertaining to goal-driven planning (see Zacks and Tversky 2001 for a review of the development of this distinction over the last few decades of cognitive science research). This correlation between macroevent size and the type of relations among subevents suggests a further factor affecting the individuation of events, namely agentivity, whose effect on the individuation of events is discussed in section 2.5. The link between agentivity and the individuation of events stems from the observation that larger single events tend to consist of subevents related by goal-driven and planning-related notions. Such notions require the presence of a rational agent capable of forming goals and acting in such a way as to attempt to reach them. We predict, then, that there will be cases in which the agentivity of

the subject, defined here as the *intentional, goal-driven behaviour* of the subject, increases the size of admissible macroevents. This prediction finds striking confirmation in a series of events described in Wolff (2003).

This, in a nutshell, is the theory of event structure to be developed here. However, by this point, we have delimited a set of well-motivated and often internally complex events. It is, of course, possible to use these events as the atoms in further structures, in the same way that constituents can be viewed as the building blocks of larger constituents, and ultimately utterances and discourses. This is a possibility that we will make some use of in chapter 3, but firstly, section 2.6 will describe two problems, concerning the modification of coordinated VPs by temporal PPs, and the semantics of *alternately*, which suggest that such larger structures are also necessary on quite independent empirical grounds. In a nutshell, the former problem is that if two separate time adverbials modify two coordinated VPs, these four constituents all come to denote predicates of the same event variable. Accordingly, there is no way semantically to associate the right time adverbial with the right VP. The result, in most cases, will be that such sentences come to denote a contradiction. Meanwhile, Lasnik (1992) has shown that *alternately* cannot denote a simple predicate of events, as to do so would lead to serious problems when *alternately* takes two conjoined antonymic predicates of events within its scope, as in *the room was alternately hot and cold*. We see in section 2.6 that both of these problems can be solved by making reference to a larger structure defined on the basis of the events delimited in the rest of this chapter.

The final two sections contain a summary, and an appendix comparing the empirical coverage of this theory with the very similar theory proposed in Moens and Steedman (1988), in order to justify the innovations presented in this section with respect to that very similar proposal.

2.2 The Variable Size of Events

Consider the two utterances in (19) below.

- (19) a. John let go of the glass. It plummeted towards the ground. A fraction of a second later, it hit the hard floor and shattered into a thousand tiny pieces.
- b. John broke the glass.

How many events are reported in each of these utterances? Counting conservatively, (19a) seems to report four separate events, namely the letting go, the plummeting, the impact and the shattering. On the other hand, our intuitions are clear, and unequivocal, that (19b) reports only a single event. However, it is quite likely that (19a) and (19b) report exactly the same portion of stuff happening, with the only distinction between the two being that (19a) does so in a more explicit and fine-grained way than (19b).⁵ For example, (19b) is compatible with the information that John let go of the glass, but it does not entail it. He could equally well have taken a hammer to it, or shattered it by practicing his falsetto. All that needs to have happened for (19b) to be true is that John did something which resulted in the glass's being broken.

The striking thing about (19), then, is that simply being more or less explicit about the details of what actually happens allows a speaker to report that the same portion of stuff that happens consists of a single event, or multiple events. Moreover, there is in principle no limit to this possibility of subdivision. The action of letting go of a glass can be further decomposed into a series of muscle movements, each of which can be explicitly reported. Moreover, each muscle movement will have its own internal components, which people who know about such things would no doubt be able to report on. And so on.

On the other hand, not all portions of stuff that happens correspond to a single event. To take one example, let us amend (19a) slightly.

- (20) John let go of the glass. It plummeted towards the ground, but miraculously survived intact. Three days later, Bill let go of the same unfortunate glass. Once again, it plummeted towards the ground. This time, it hit the hard floor and shattered into a thousand tiny pieces.

⁵A similar point was made by Link (1983) with respect to the denotation of nominals. Link observed that *the cards on the table* and *the decks of cards on the table* generally refer to the same stuff, but packaged in different ways, as there are 52 cards in each deck. We can tell that they are packaged differently by considering collective predicates such as *be numbered consecutively*. Link observes that (i) and (ii) do not mean the same thing: in the case of (i), if there are three decks of cards, then there are 156 cards, which should accordingly be numbered 1–156. In the case of (ii), however, the three decks should simply be numbered 1–3.

(i) The cards on the table are numbered consecutively.

(ii) The decks of cards on the table are numbered consecutively.

Bach (1986) was the first to point out the formal parallels between the structures of the domains of individuals and events, which suggested that extending Link's lattice-theoretic analysis of individual denotations to the domain of events would be profitable.

In this case, we are unwilling to claim that the sequence of happenings constitutes a single event. We find, for example, that there is no equivalent of (19b) in the case of (20) (we will come back to the significance of this in a minute). *John broke the glass* and *John and Bill broke the glass* are false, while *Bill broke the glass* is true, but does not cover the same portion of stuff that happens as (20) does.

And we want to know why this should be the case. To put the question more explicitly, we assume for now that sentences denote properties of existentially quantified event variables, but it also seems that not every theoretically possible property of such a variable actually makes a plausible property of a single event in cognitive terms. Furthermore, we know that subparts of single events can also be considered as independent events in their own right, as shown by comparing (19a) and (19b), but we know from (20) that not every collection of independent events can be considered as a single event. So what determines the upper bound on the size of individual events?

Intuitively, the problem with (20) is that the two glass-droppings are temporally too far apart to be seriously considered as a single event. Firming this claim up, we will assume that only temporally continuous portions of stuff that happens can be considered as a single event, which seems reasonable. And we can find other such common-sense restrictions too. For example, we are very unlikely to admit (21) as a description of a single event.

(21) A casserole cooked in an oven in England and immediately afterwards a sheep bleated in New Zealand.

The two parts of this portion of stuff that happened, the cooking and the bleating, are simply too unrelated to be construed as part of the same event. In this case, though, it seems that the unrelatedness is likely to be due to the spatial distance between the cooking and the bleating parts. I will assume, then, that a single event must happen in a single place, as well as at a single time. However, even an example like (22), which meets these two criteria, is unlikely to be considered as a single event.

(22) John read a book for a while and then Bill, who was sitting just next to him, laughed.

Here, the problem seems to be that the two portions of stuff that happened, the reading and the laughing, involve completely disjoint sets of individuals, with no appropriate rela-

tion established between them.⁶ And even if both portions of stuff that happened involve the same individual, there is no guarantee that they will be acceptable as a single event. (23) is a case in point, where it appears that the two subevents are not sufficiently closely related to be construed as a single macroevent.⁷

(23) John read a book for a while, then went for a walk.

Ideally, though, to make this notion of a single event clearly falsifiable, we would like a test for how we individuate events. In fact, one such test has been proposed, by Fodor (1970), and recently used experimentally with some success by Wolff (2003). This test relies on the following principle.

(24) **Fodor's Generalisation:**

A single verb phrase describes a single event.

If (24) is true, then a portion of stuff that happened must be construable as a single event if we can describe it with a single verb phrase.⁸ To see why (24) makes sense, we might consider Higginbotham's (1985) syntactic implementation of Davidson's proposed event variable. Higginbotham argues that the event variable is bound by tense. In modern syntactic terms, this suggests that the complement of T^0 , namely VP, denotes a property of events, and that T^0 functions to existentially quantify the event variable, and situate the event temporally with respect to the reference time. If this story is correct, though, an almost

⁶To be sure, the notion of *appropriate* needs to be clarified, and will be in what follows. The qualification is needed because sequences of occurrences involving completely disjoint sets of individuals can nevertheless be considered as a single event in cases such as (i), which could equally be described by (ii).

(i) John flicked a switch. The light went on.

(ii) John turned the light on.

See also the *argument coherence condition* of Pustejovsky (1995:186) in this respect.

⁷We will return to the issue of how closely related two events must be to count as a macroevent throughout this chapter. As a first approximation, we can say that the two events in (23) are *independent*, in the sense that there is no reason for either event to influence the occurrence or otherwise of the other.

⁸I restrict this to verb phrases, rather than sentences, for two reasons. The first is because of the effect, noted by Henk Verkuyl (e.g. 1993), that the type of subject can have on the aspectual class of the utterance. For example, bare plurals or mass nouns coerce a telic event into an atelic event. Although it is not implausible that a sentence such as *People turned up for hours* describes a single event, I wish to steer clear of this area here.

The second, and more substantial, reason for stating (24) in terms of verb phrases is that a sentence clearly does not have to describe a single event. We have seen three cases where this is not the case, in (21), (22), and (23), and we will discuss this problem more generally in section 2.6. For now, though, stating (24) at the level of verb phrases hopefully bypasses this fact.

automatic consequence is that a verb phrase must denote a property of a single event. We see, then, that Higginbotham's theory of the syntactic encoding of the event variable gives us a way to understand Fodor's generalisation.

As a concrete illustration of the effect of (24), consider the examples in (25).

- (25) a. Floyd caused the glass to melt on Sunday by heating it on Saturday.
- b. * Floyd melted the glass on Sunday by heating it on Saturday. (Fodor 1970:432–3)

The oddity of (25b) in comparison to the well-formed (25a) can be explained as a result of two conflicting constraints. On the one hand, the VP *melt the glass* requires the glass-melting occurrence to be construed as a single event. On the other hand, we know that this event did not occupy a continuous stretch of time, as Floyd was heating the glass on Saturday (and presumably, by typical Gricean considerations, not on Sunday, or else it would have been far more co-operative to say so), and the glass melted on Sunday. We saw, with reference to (20) above, that a single event must occupy a continuous stretch of time. There is no way to resolve these two demands, and so the sentence is infelicitous. Moreover, note that none of the examples above which did not correspond to a single event above could be expressed with a single verb phrase, which offers some further intuitive support for Fodor's generalisation.

Fodor claims that the factor distinguishing (25b) from (25a) is *direct causation*. A lexical causative is only appropriate if the result state is brought about directly by the actions of the subject. This notion certainly does a good job of unifying the examples given in (20), (21), (22) and (23), as none of those examples can reasonably be claimed to describe direct causation on any intuitively plausible understanding. In fact, though, we will have reason later to expand Fodor's characterisation to cover the family of *contingent* relations among events to be introduced in section 2.4. However, it is worth considering exactly what direct causation might mean here, as we see here a way in which variable pragmatic coarse-graining is fundamental to the linguistic encoding of event structure.

A typical definition of direct causation, for example Lewis' (1973) notion of *causal dependence*, holds that causation is a transitive notion, such that if an event e_1 causes an event e_2 , which in turn causes e_3 , then we may reasonably claim that e_1 causes e_3 , despite the presence of an intervening event. The distinguishing characteristic of direct causation

is that it does not admit intervening causes. In the above scenario, e_1 is not a direct cause of e_3 , as e_2 intervenes between the two. Let us formalise this approach as follows.

- (26) An instance of a transitive, irreflexive, antisymmetric relation R holding among two events e_1 and e_2 is *direct* iff $R(e_1, e_2) \wedge \neg \exists e_3. (R(e_1, e_3) \wedge R(e_3, e_2))$.

The definition is clear enough, but it means that our notion of direct causation is dependent on the set of events in question. For example, John letting go of the vase in (19a) could not count as a direct cause of the vase's breaking, as there is an explicitly mentioned, and causally related, intervening event of the vase plummeting towards the ground. Furthermore, we saw above that the event of John letting go of the vase can be further subdivided without limit. Kamp (1981) took this claim to its logical conclusion, and claimed that it was possible to subdivide arbitrarily the transition between any two states, leading in effect to a situation in which the definition of a direct relation in (26) is inapplicable, as there is always an intervening cause. Technically, the causal ordering over events becomes *dense*, in the following sense.

- (27) An order $<$ is *dense* iff $\forall x \forall y. (x < y \rightarrow \exists z. (x < z \wedge z < y))$

Clearly, a relation giving rise to a dense order precludes the possibility of identifying any two related elements as directly related, in the above sense. And yet the direct causation requirement is empirically well-motivated, and Kamp's arbitrarily fine-grained subdivision of events is conceptually solid. Something has to give.

Bittner (1999) introduced the notion of *variable pragmatic coarse-graining* as a route out of this conundrum. She notes, following Kamp (1979), that some notion of immediate precedence is needed to capture the use of adverbials such as *immediately*, which are hard to define in any principled way on the classical view of time as densely ordered, a view which the approach of Kamp (1981) essentially maintains for these purposes. Bittner invites us to consider dialogues such as the following.

- (28) Q: When did Mary leave the party?

A: She left immediately before John.

- *Better informed observer*

B: No, she didn't. I saw her leave before Bill, and Bill left before John

- *Pragmatically challenged observer*

C: No, she didn't. I watched the door the entire second before John left, and she didn't leave during that time.

(29) Q: What happened here?

A: A woman tried to rob a bank, and John shot her dead.

- *Better informed observer*

B: No, he didn't. His bullet just grazed her ear. But this frightened her so much that it caused a heart attack, and that was the immediate cause of her death.

- *Pragmatically challenged observer* (watching replay on film)

C: No, he didn't. His bullet started a long chain reaction. For when this molecule in his bullet got close to that molecule in her heart then their electrons repelled, and that made the heart molecule go that-a-way, which in turn caused... , and that [*last mentioned molecular event*] was the immediate cause of her death. (Bittner 1999:19)

Bittner observes that B's objections are relevant to our determining the validity of A's claims, but that C's objections are not, because they simply involve too fine-grained an attention to detail. Moreover, this holds in exactly the same way for *immediately* in (28) and the resultative phrase in (29). Bittner concludes that:

'linguistic events are not part of the continuous reality that surrounds us. They are part of a discrete conceptual structure that we may impose on this reality in order to talk about it. The issue is not what is out there, but rather how we choose to conceptualize it given our interests in a particular context... Depending on the number and size of these topical events, the grain of the generated time structure will vary — from coarse-grained, if the topical events are few or long-lasting, to fine-grained, if they are short-lived and many. But even though the grain in principle can be refined to an arbitrary level of precision, the time structure generated by any finite event structure will be discrete.' (Bittner 1999:22)

The message to take away from this section, then, is that the flow of stuff that happens does not come readily packaged into identifiable events any more than the matter we are confronted with is inherently delimited into individuals. Instead, we package this stuff that happens ourselves, and in a way that is pragmatically sensitive to the requirements

of the current discourse environment. The coarseness of the grain used in this packaging determines what counts as an individual event, and in the light of Fodor's generalisation, determines what can be expressed by a single verb phrase. On the other hand, there are restrictions on what can be considered as a single event, which lead to restrictions on the coarseness of the grain with which this packaging may apply. We discussed Fodor's generalisation that lexical causatives can only encode direct causation in this light. Although we will modify this proposal below to allow single verb phrases to describe other relations among events, we saw that Fodor's position already allowed us to rule out temporally or spatially discontinuous portions of stuff that happened as single events, as well as cases where disjoint and unrelated sets of participants are involved in different subevents. All this shows that, despite the clearly flexible nature of our ability to package up stuff that happens into events, and despite the ready possibility of one event forming a subpart of a larger macroevent, there are clear upper bounds on what can be considered as a single event.

2.3 Aspectual Classes

We saw in the previous subsection that the linguistic individuation of events is a largely pragmatic matter, and one that requires sensitivity to the current discourse context. We also saw that the requirement, captured in (24), that a single verb phrase describes a single event imposes a way for the speaker to signal the coarseness of the grain with which he is describing events. For example, a speaker who utters (19a) is clearly describing events from a more fine-grained perspective than one who utters (19b).

However, not all verb phrases are alike in the relationship between the single (macro)event which they describe and the subevents which they may be composed of. The differences which certain classes of verbs exhibit with respect to this relation give us a way of approaching the aspectual classes delimited by Vendler (1957) and subsequently elaborated by researchers too numerous to mention.

Vendler observed that different English verbs (or, more accurately, verb phrases) behave differently with respect to a number of distributional tests, assumed to have semantic reflexes. Two core tests each independently divide the class of verb phrases in two, thereby jointly giving four classes of verb phrase, the *accomplishments*, *achievements*, *activities*

and *states*.⁹

The tests which divide the class of verb phrases in this way are, firstly, compatibility with the progressive tense, and secondly, the forms of *wh*-questions which are most natural with a given example. Although these tests are assumed to be reflexes of deeper semantic properties, then, they are essentially syntactic, distributional tests, and it is in this way that I will describe them here, before turning shortly to a discussion of the semantic properties that they express.

The first distinction Vendler makes is between those verb phrases which can take the progressive, and those which can't. Accomplishments (30a) and activities (30b) belong to the former category, while achievements (30c) and states (30d) belong to the latter.

- (30) a. I am running a mile (drawing a circle, building a house,...).
b. I am running (writing, working,...).
c. * I am spotting the plane (appearing, blinking,...).
d. * I am knowing the answer (loving you, understanding antisymmetry,...).

The two classes which can take the progressive, and the two that cannot, can be further distinguished according to the types of *wh*-questions which can felicitously be formed from them, when the question concerns the temporal location and duration of the event in question. Accomplishments (31a) and achievements (31c) reject questions based on the phrase *for how long*, in favour of phrases which imply an endpoint to the event in question, while the opposite is true of activities (31b) and states (31d).¹⁰

- (31) a. i. # For how long did he run a mile (draw a circle, build a house,...)?
ii. How long did it take to run a mile (draw a circle, build a house,...)?
b. i. For how long did he run (write, work,...)?
ii. # How long did it take to run (write, work,...)?

⁹Vendler in fact presents many more than two tests, but the others are all intended to reinforce the two distinctions made by the progressive and *for how long* tests, so I ignore them here.

¹⁰The actual forms of the *wh*-questions used to test accomplishments and activities on the one hand, and achievements and states on the other, differ, presumably as a consequence of the results of the test given in (30) above. Explanations for the divergent acceptability of different question forms for accomplishments and achievements can be easily found in view of the semantic differences between the classes to be explored below.

- c. i. # For how long did you spot the plane (appear, blink,...)?
- ii. At what time did you spot the plane (appear, blink,...)?
- d. i. For how long did you know the answer (love me, understand antisymmetry,...)?
- ii. # At what time did you know the answer (love me, understand antisymmetry,...)?

Vendler comments on the semantic significance of his distributional tests in several places, perhaps best summarised in the following passage:

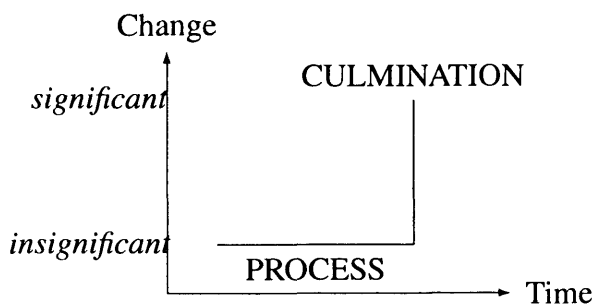
‘The concept of activities calls for periods of time that are not unique or definite. Accomplishments, on the other hand, imply the notion of unique and definite time periods. In an analogous way, while achievements involve unique and definite time instants, states involve time instants in an indefinite and nonunique sense.’ (Vendler 1957:149)

This shows that Vendler conceived of the availability of the progressive as corresponding to the description of a *period*, as opposed to an instant; and that he saw the different forms of acceptable *wh*-questions as corresponding to a distinction analogous to the definite–indefinite distinction in nominals. The latter distinction has, in fact, not been widely adopted. In the same spirit as Bach’s (1986) extension of Link’s (1983) analysis of the structure of the domain of individuals, which found an analogous structure in the domain of events, researchers have found that a more apt analogy with the nominal domain relates this pattern to the mass–count distinction — as Vendler notes elsewhere, a verb phrase which rejects *for how long* questions is canonically temporally bounded, in much the same way that a count noun denotes a canonically spatially or spatiotemporally bounded individual. More specifically, the presence of a typical endpoint, or *telos*, ‘which has to be reached if the action is to be what it is claimed to be’ (Vendler 1957:145), has long been taken to be a feature distinguishing the two groups of verb phrases. Although the terms remain intuitive, rather than formally defined, this gives us a reasonably clear first impression of the semantic correlates of Vendler’s distributional tests.

To make this notion more precise, I wish to adopt a common idea in the literature (see in particular Pustejovsky 1991, although clear precursors to this position can be found in Dowty 1979, Bach 1986, Parsons 1990, and elsewhere). The idea is that, although it is fair

to say that, at a microscopic level, all accomplishments, achievements and activities consist of subevents,¹¹ they differ in which components they realise of a relatively coarse-grained macroevent-subevent structure, which I will refer to as the *maximal core event*. Any subset of the maximal core event, I will refer to as simply a *core event*. The maximal core event consists of two subevents: the *process*, which corresponds to Vendler's 'periods' in the above; and the *culmination*, the typically attained climax which characterises a telic event. We may think, then, of a maximal core event as schematised by the following diagram, where the left–right direction represents temporal or causal progression; the horizontal line represents a relatively continuous or homogeneous process, where such changes as may occur are linguistically irrelevant; and the vertical line represents an instantaneous (again, at least from a linguistic perspective), linguistically significant change.¹²

(32)



The aspectual classes differ in which of the two subevents they realise. Specifically, we arrive at the following decompositions of the aspectual classes:

- (33) a. **Accomplishment** = process + culmination (= maximal core event)
- b. **Achievement** = process + culmination (= maximal core event)
- c. **Point** = culmination
- d. **Activity** = process
- e. **State** = \emptyset

¹¹Interestingly, it appears that states do not. Specifically, it is hard to find any particular subparts of a state to describe, seeing as states are, by definition, static. This position echoes that of Verkuyl (1993:ch.14), according to which the interval at which a state is true is not subdivided into discrete “milestones” as it would be for an event.

¹²This diagram recalls the diagram of a *nucleus* presented, in a similar context, in Moens and Steedman (1988). See section 2.8 for an explicit comparison of my approach with the theory presented in that paper.

There are two likely immediate objections to this decomposition. The first, and less serious, is that the representation of state as neither process nor culmination might seem implausible. However, if we see the possession of a process and/or culmination as possession of a spatiotemporal and causal location and “shape” (as I suggest we should), then the absence of either of these components from states would correspond to the reasonably clear intuition that states lack such a location and shape (compare Vendler, who writes that ‘States and some achievements cannot be qualified as actions at all’ (p.149), or van Voorst 1992:78, ‘States do not take place or do not happen’).

The more serious worry is that this decomposition does not draw a line between accomplishments and achievements, and introduces a new aspectual class, namely the *points*. It only provides a vague approximation of Vendler’s taxonomy, in that case. It is quite reasonable to ask what justifies these alterations, and whether we lose any empirical coverage or predictive power by making these changes.

With regard to this latter question, I believe that the answer is no. Recall that the characteristic which distinguishes accomplishments and achievements for Vendler is the fact that only accomplishments can occur in the progressive. This, however, is far from true, as Vendler himself noted (see also Verkuyl 1989). Many verbs ordinarily classed as achievements still allow the progressive with a “prospective” meaning, asserting that the culmination is about to be reached.

(34) a. I’m reaching the summit as we speak.

b. John is winning the race.

c. He’s arriving any minute now.

As a diagnostic of the accomplishment–achievement divide, then, the progressive is looking decidedly shaky.¹³ I claim that this is because use of the progressive constitutes a manipulation of event structure, while the distinction between accomplishments and achievements lies outside event structure, in the realm of agentivity, to which we return in section 2.5.¹⁴

¹³Ramchand (2006) has some rather more subtle criteria for distinguishing at least the class of creation and consumption accomplishments from achievements, but I became aware of this more recent draft of Ramchand’s work too late in the day to evaluate these criteria.

¹⁴In that section, we will also discuss the interpretive distinction between progressives formed from ac-

To see that the progressive manipulates event structure, we need to simply consider its meaning. Given that the progressive is still incompatible with states, we are left with two cases. The first case is where the progressive is formed from an activity-denoting verb.¹⁵ In this case, the progressive tells us that the activity in question is underway. The second case is where the progressive is formed from a telic verb. In this case, the progressive tells us that the preparatory process is underway, and so that, all else being equal, the culmination will be reached. The difference between the progressive forms of accomplishments and achievements on the one hand, and of activities on the other, is purely a matter of the absence of a long range “inertia” culmination, to borrow a term from Dowty (1979), in the latter case only. What I mean by an “inertia” culmination is that, despite the ongoing character of a progressive verb denotation, the progressives of accomplishments and achievements imply that, all else being equal, the activity in question will be finished and the characteristic endpoint associated with the predicate will be reached. Such an implication is still characteristically absent in the progressive of an activity, as it is in activities in general.

The function of the progressive is simply to locate the reference time within the temporally extended process component of a core event, then. As accomplishments, achievements and activities all contain a process component, this is unproblematic. We see from (33c) that the new aspectual class of *points* are distinguished from these in not having a preparatory process at all. Such events have culminations, but appear to come from nowhere, so to speak. Perhaps the clearest examples are verbs such *notice* and *recognise*, but other likely candidates include *hiccup*, *blink* and *hop*. As these are associated only with culminations, and not with any nonpunctual events, we predict them to be always incompatible with the progressive, except through coercion to a temporally extended event, for example through iteration. This prediction is correct, as (35) shows.

(35) a. *John is noticing the carnage.

complishments and achievements. It will be observed that, whereas achievements require the culmination to be imminent for the progressive to be legitimate, this is not the case for accomplishments. For instance, it is legitimate to claim to be climbing a mountain as soon as you take your first step towards the summit (or even earlier, as we will see in section 2.5), but not legitimate to claim to be reaching the summit until you are practically at the top.

¹⁵Here, and occasionally in what follows, I talk of a verb denoting a particular aspectual class. This should be understood in the obvious way, as a shorthand for denoting a property of an event which belongs in that aspectual class.

- b. * John is recognising his long-lost brother.
- c. ✗ John is hiccupping.
- d. ✗ John is blinking.¹⁶
- e. ✗ John is hopping.

Although we are not yet in a position to explain the distinction between accomplishments and achievements, then, this section has aimed to show that a conception of neo-Vendlerian aspectual classes in terms of the presence or absence of each of two subevents makes accurate and plausible predictions with respect to Vendler's progressive and *wh*-question tests. It seems, then, that a model which decomposes certain verb phrase meanings into just two subevents makes the right predictions concerning the distribution of those verb phrases in progressives and *wh*-questions.

2.4 Single Events from Multiple Verb Phrases

Consider again Fodor's generalisation (24), repeated below.

(24) Fodor's Generalisation

A single verb phrase describes a single event.

I have formulated this generalisation as a one-way implication. Although a single verb phrase necessarily denotes a property of a single event, then, a single event may be represented by multiple verb phrases. (24) is the presumed reason for the oddity of an example such as (25b), repeated below, on the assumption that a single event cannot occupy a discontinuous period of time, while (25b) refers to just such a period.

(25b) *Floyd melted the glass on Sunday by heating it on Saturday. (Fodor 1970:432–3)

A one-way generalisation is strong enough to capture this fact. Excluding interpretations of a single VP which require reference to two different macroevents makes no predictions regarding which readings are available in *multiple* VPs. In fact, I wish to argue that

¹⁶An example such as this may also be marginally acceptable if we consider a blinking event in excruciatingly slow motion, where it would appear to be associated with a nonagentive preparatory process of John's eyelid lowering. As ever, it is the linguistic presentation of an occurrence as consisting only of a culmination which is relevant, not the fine objective and language-independent structure of an occurrence. I take it that, viewed in this way, *blink* usually describes a culmination only.

a one-way generalisation is accurate, and that extending (24) into a biconditional would result in too strong a statement.

In more concrete terms, this means that I predict that it is possible to find cases where multiple VPs describe a single event. In fact, the fullest exploration of this prediction will come with the discussion of extraction out of adjuncts in section 3.2, but in the interests of non-circularity, I will discuss this prediction from other perspectives here and in the following subsection.

To some extent, this issue is bound up with another one, namely the question of the extent to which subevents, and relations among subevents, are represented syntactically. Lexical decomposition is common in a variety of approaches to the semantics of aspectual classes, from Dowty (1979) through to Pustejovsky (1995), and the current work, by adopting notions of subevent structure, continues in that tradition. The question of whether we should follow the line of research extending from Lakoff (1970) through to Hale and Keyser (1993) and Ramchand (2006), among others, and explicitly represent such decompositional structure in the syntax, is somewhat more thorny, though. Clearly, if we were to take an extreme syntactocentric position according to which all contingent relations corresponded consistently to some syntactic relation (for instance complementation), then it would be impossible for multiple VPs standing in other relations (such as adjunction or coordination) to come to describe a single event. The theory under development here is clearly incompatible with such a radical syntactic position, then.

I will return to the question of the relationship between phrase structure and the semantic structures I am developing in section 3.4, but for now, I wish to justify my claim that multiple VPs standing in, for example, an adjunction relation do not have to correspond to multiple macroevents. My reasons for making this claim are twofold. Firstly, in certain cases, the relations between events described by VPs standing in an adjunction relation¹⁷ can be interpreted as extremely similar, or even identical, to the relations among subevents found in decomposed lexical verbs. Secondly, we will see, in section 2.6, an automatic combinatorial process by which multiple individual event variables come to be identified, despite the constituents from which they originate not standing in a core phrase-structural

¹⁷By an *adjunction relation*, I mean that one of the two VPs is within a constituent which is adjoined to the other. The first VP doesn't have to be directly adjoined to the second. If, for example, the first VP is c-commanded by a preposition, forming a PP, and that PP is adjoined to the other VP, that still counts for my purposes here.

relationship. If this is accurate, something extra would have to be *added* to the theory to prevent the syntactic instantiations of macroevent–subevent relations spilling out of the realm of the core syntactic relations among specifiers, heads, and complements within a single VP-shell structure. The onus, then, is surely on anyone who might deny the possibility of macroevent–subevent relations holding in noncanonical syntactic configurations to say why this should be so.

The cases I have in mind are ones like (36–37) below.

(36) John fell to the ground after being punched.

(37) a. John read an introduction to landscape gardening before designing his garden.

b. John designed his garden after reading an introduction to landscape gardening.

In all of the above examples, we see a nonfinite verb phrase embedded under a preposition and adjoined to a VP. The preposition specifies something of the relation (in these cases, purely temporal) between the event properties described by the two VPs. However, the interpretations we naturally assign to the examples in (36–37) are stronger than that. (36) is naturally taken to describe a case in which John fell to the ground *as a result of* being punched. While the temporal relation specified by *after* remains, then, there is an additional, causal, nuance added.

Something similar is true in (37), except that, in this case, the extra nuance does not seem to be causal in nature. It seems intuitively wrong to claim that reading an introduction to landscape gardening *causes* John to design a garden. Instead, I claim, with Wolff (2003), that a distinct relation of *enablement* can be identified, and holds in such cases. In each of the cases in (37), we can say, in addition to the basic relation specified by the preposition, that reading the book enabled John to design his garden.¹⁸ I claim that, when a relation of either causation or enablement holds between two events, the two may be construed as a single event.

This same enablement relation may be seen in a further class of adjuncts, illustrated in (38).

(38) John came to England in order to meet the Queen.

¹⁸Unlike causation, then, enablement is a relation not just between events, but between an agent (John in (37)) and a set of events, in a sense to be made more clear in section 2.5. For now, I will continue to concentrate on the events that enablement relates, returning to the role of the agent in the following section.

Again, here, we find, intuitively, an enablement relation holding between the two events. Coming to England didn't cause John to meet the Queen, but it may well have facilitated it, and we are told that John thought that it would help him to do so. The difference in the case of (38) is that whereas the enablement relations in (37) seem to be an addition to the core meanings of the prepositions, in (38) the phrase *in order* tells us explicitly that, firstly, John's goal is to meet the Queen, and secondly, he believes that coming to England will enable this.¹⁹ The enablement relation, or at least the agent's belief that the enablement relation holds, is therefore directly encoded by *in order*, but only present in the interpretation of VPs linked by a preposition such as *before* or *after* as an enrichment of their core meaning.

We can now highlight two more properties of these relations of causation and enablement. Firstly, we notice that there is no necessary correspondence between the phrase structural configuration of the two event-denoting constituents, and the relations holding between them. So in (38) the event described in the matrix VP (John coming to England) enables the event described in the adjunct (meeting the Queen), and the same is true in (37a). But in (37b), the relation goes the other way round: the event described in the adjunct (reading a landscape gardening book) enables the matrix event (designing a garden).

Secondly, we notice that enablement is a modal relation in a way that causation is not. In (38) we have no guarantee that John actually did meet the Queen as a result of coming to England. If we compare this to a standard definition of causation (see, for example, Lewis 1973) as in (39), we find that two causally related subevents are inseparable — if the causing event happened, then so did the caused event.

- (39) e_1 *causes* e_2 iff e_1 and e_2 both occur, and in the most accessible possible worlds in which e_1 did not occur, e_2 also did not occur.

This distinction between causation and enablement has a linguistic reflex in the felicity of utterances such as the following. Whereas (40a) is quite acceptable, (40b) is contradictory. This is as expected on the current theory, because the modality of the enablement

¹⁹There are some atypical uses of *in order* where the goal is attributed not to the agent of the matrix event, but rather to the speaker or some other agent. A typical case of this is literary criticism, where the critic may implicitly attribute a goal to a writer, who ultimately has control over all events reported in a text, whether "agentive" or not, involving the protagonists in the text in question. This gives examples such as *The ship sinks in order to further the plot* (Culicover and Jackendoff 2001:504). As far as I am aware, extraction from adjuncts is always impossible in such cases, although I do not understand why.

relation allows us to separate the occurrence of the matrix event from the adjunct event in (40a) in a way which is simply not possible in (40b).

- (40) a. John came to England in order to meet the Queen, but he never got to meet her.
 b. # John fell to the ground after being punched, but he {never fell to the ground / was never punched}.

So a causing event always produces its effect in the normal course of things, whereas an enabling event does not necessarily produce the event which it enables. This gives us a way of understanding a further asymmetry between the two relations. That is, there are no lexical items that directly encode enablement relations,²⁰ whereas there are a great deal of lexical items that encode causation. If a single lexical item were to directly encode enablement, this would mean that it described two subevents, the first of which happened, and the second of which may or may not have happened. Natural language does not seem to work like this: modality is a property of lexical items or larger structures, but not a property of internal components of lexical items.

Viewed in this way, causation and enablement form a natural class. Causation may perhaps be seen as a special case of enablement, in which the modalities and uncertainties of the more general notion are removed. I will continue to treat the two relations independently here, though, as we will see further factors which distinguish these two relations in the following section. For now, though, I wish to identify this class of relations with the *contingent* relations discussed in Moens and Steedman (1988).

- (41) Contingent relations \supseteq {causation, enablement}.²¹

Note that contingent relations are partially independent of a second family of relations among events, namely the purely temporal relations discussed with reference to (36–37) above. The independence is not total, however. It seems reasonable to claim that our naïve

²⁰By *directly encode*, I mean that the lexical items in question force a given interpretation among events. This is in contrast to the pattern we will see below concerning many prepositional participial adjuncts, which are interpreted in a way which is *compatible with*, but does not force, relations of causation and enablement among events.

²¹I leave open the possibility of further relations being included in the contingent family. For instance, Wolff (2003) discusses causation and enablement as forming a natural class with a prevention relation, in terms of Talmy's (1988) theory of force dynamics. Meanwhile, causal relations form only a small part of Kehler's (2002) theory of coherence relations. Again, comparison of these approaches is beyond my scope at the present time.

conception of contingency is one in which the causing or enabling event always precedes the caused or enabled event. We may, then, enrich a linguistically encoded purely temporal relation into a contingent relation, but only subject to the condition that the temporal order of events is congruent with the contingent order of events in this way, as specified in (42).²²

$$(42) (e_1 \text{ CAUSE } e_2 \vee e_1 \text{ ENABLE } e_2) \rightarrow e_1 \propto e_2.$$

Such pragmatic enrichment is obviously constrained by world knowledge. We are only willing to countenance a contingent construal of a linguistically encoded temporal relation if such a contingent construal matches our knowledge of how the world works. We therefore predict a three-way split in our reactions to sentences, such as those in (36–37), which encode temporal relations among events. So in (43a), we are happy to entertain the possibility that John collapsed as a result of his collision with a lamp post.²³ It would have hurt, and things that hurt sometimes make us fall over. But such a possibility doesn't seem so likely in the case of (43b). *The Master and Margarita* is a pretty powerful book, but it's unlikely to actually bring the reader to his knees. The most likely interpretation for (43b), then, is that John collapsed for some other reason — he was ill, or he fainted — and it just happened to be after he had been reading. In (43c), on the other hand, there is simply no chance of John's collapse occurring as a result of the collision. Whatever caused John to collapse must have come before the collapse itself, and the collision came afterwards.

(43) a. John collapsed after colliding with a lamp post.

b. John collapsed after reading *The Master and Margarita*.

c. John collapsed before colliding with a lamp post.

This predicts a difference between (43b) and (43c) in terms of coercibility. The absence of a contingent reading in (43c) is due to a fundamental component of our conception of the way the world works: causes precede effects.²⁴ On the other hand, the absence of a contingent reading in (43b) is due to a much more trivial part of that conception, namely

²²I use the symbol \propto , following Kamp (1979), to denote a relation of temporal precedence between events.

²³Note that causation is the only contingent relation at issue here, seeing as we know that both events happened, and it is intuitively unhelpful to talk of hitting a lamp post enabling John to collapse. I will return to the reason for this intuition in the following section.

²⁴I understand that this may not be true in theoretical physics, for example, but that is irrelevant to the question of how we naïvely conceptualise the world.

that reading a book isn't that bad. Accordingly, we are more willing to accept an alteration to the latter belief than the former. Maybe, sometimes, reading a book really is very hard work indeed. And so it seems that we can indeed construe the two events in (44) as causally related.

- (44) Some lengthy modern novels demand a great degree of intellectual and even physical effort from the reader. Some would say they demand too much. I mean, John collapsed after reading *Finnegans Wake*.

On the other hand, no amount of context seems to be able to help (43c). Even in (45), where it is explicitly stated that causes follow effects, the two events still resist a contingent construal.

- (45) We had a weird night out last night. After a few beers, we fell through a wormhole into a parallel universe where the flow of causation was reversed so that a cause happens after its effects. It was terrible. John collapsed before colliding with a lamp post. So don't expect too much from him today.

So far, we have sketched characterisations of two contingent relations holding among events, but said nothing concerning the significance of these relations. Causation, and more specifically direct causation, is, of course, familiar from the discussion of relations among events in section 2.2. I now wish to expand the claims in that section to the following.

(46) Macroevent formation

If two subevents form part of the same macroevent, they must be related by a contingent relation. If two events are related by a contingent relation, then all else being equal, they may or may not jointly form a macroevent.

(46) suggests that the direct causation data discussed in section 2.2 are actually part of a wider picture. Recall again condition (24).

(24) Fodor's Generalisation

A single verb phrase describes a single event.

In conjunction with (46), we predict that, all else being equal, contingently related subevents should be describable by a single verb phrase, if an appropriate verb exists.²⁵ This prediction seems, in fact, to be largely accurate. Of course, details are lost in the translation from a multi-verb description of an event to a single-verb description of the same event, but we are nonetheless willing to accept the single-verb description as a valid portrayal of the same portion of stuff that happens in all the relevant cases. We have already seen numerous examples of this phenomenon with respect to direct causation and variable pragmatic coarse-graining in section 2.2. I will now illustrate that the same holds for the enablement relations discussed in this section.

We have discussed two classes of enablement relation. In the first, enablement is linguistically encoded, for example by *in order* in (38). In the second, an enablement construal arises through enrichment of a linguistically encoded temporal relation, as in (37). In each case, however, we are able to take the enabled event, call it the *goal event*, as standing for the entire complex of enabling event + goal event. Consider the following situation.

- (47) John is sat in an armchair, deep in concentration, reading an introduction to landscape gardening. His housemate Bill asks him what he's doing. 'I'm designing a garden', replies John.

This exchange is completely natural, even though John is not actually designing a garden as he speaks. What he is doing is something that will *enable* him to design a garden at a later stage — what he is doing could be described in more detail as *reading an introduction to landscape gardening {before designing/in order to design} a garden*. Note, moreover, that the truth conditions of (47) are independent of whether John ever actually designs a garden — it is only necessary that reading the book enables him to do so. So a single verb, by hypothesis describing a single event, comes to stand for the same portion of stuff that happened that could otherwise be described by two separate verbs describing two distinct events standing in an enablement relation.²⁶

Exactly the same points hold in the following example, parallel to (38).

²⁵Of course, given that we have cast Fodor's generalisation as a one-way implication, we do not expect this prediction to hold in every case, which would be a fallacy equivalent to affirming the consequent. However, it is not unreasonable to expect at least a tendency in this direction.

²⁶Ad Neeleman has pointed out the following interesting restriction on this process. We can imagine a single transitive verb with the meaning *X reads something in order to prepare Y*, but not with the meaning *X reads an introduction to landscape gardening in order to prepare Y*. I have no idea why verbs and their arguments should be treated differently in this way, although it is reminiscent of Hornstein and Weinberg's

(48) I'm seeing some friends from Monday to Thursday.

(48) can quite felicitously be uttered if, in fact, the speaker will only be actually visiting friends from Tuesday to Thursday, but has to travel all day on Monday because they live in the Outer Hebrides and he's marooned in London. The *travelling to enable oneself to visit friends* is legitimately counted as part of visiting friends, even if no friends were actually visited during the travelling period, and (48) could be equivalently (if more accurately) replaced by *I'm seeing some friends from Tuesday to Thursday, and travelling up to meet them on Monday*. Also, note that the following sentence is not (quite) a contradiction.

(49) ?I was away visiting friends last week, but I didn't actually manage to visit any of them.

(49) is interpretable if the first conjunct actually has the meaning *I was doing stuff that would have enabled me to see my friends under normal circumstances*. Again, because of the modal nature of enablement, there is no contradiction if the goal event is not actually realised. We see once again that a description of a single event may also conceal multiple subevents related by enablement relations.

Now consider what happens when there is no such contingent relation holding between two events. Again, this has already been covered from the perspective of direct causation in section 2.2, but I will expand the discussion here to explicitly cover cases where an enablement relation is also absent. To this end, consider the following variant of (47).

(50) John is slumped in an armchair, a cup of tea in one hand and a bacon butty in the other, watching the rugby league on TV. His housemate Bill asks him what he's doing. 'I'm designing a garden', replies John.

Unlike (47), this exchange is somewhat bizarre. John's response triggers some unidentifiable extra effect. Is he being sarcastic, or lying? Or is the rugby league somehow influencing his garden design process? Perhaps he has a thing for rectangular lawns with H-shaped sticks at either end, and wants to get the proportions perfect. Regardless of what the correct answer is, it is clear that either the Gricean maxims are being flouted, or we

claim (1981:65) that 'subparts of (most particularly arguments contained in) semantic words are not referential in meaning', which forms part of a theory which describes certain restrictions on preposition-stranding in terms of a 'semantic word' condition. See section 3.2.5 for discussion of such theories, and also Kluender (1992) for a theory concerning the processing cost of embedding referential elements within predicates.

are required to go through some extra cognitive effort to construct a contingent relation between watching the rugby and designing a garden. Leaving the two events unrelated, when both are described by a single verb phrase, is not an option.

Again, the same point can be made with respect to (48). This sentence simply is not true if, rather than travelling to see friends on Monday, the speaker sits around all day playing online poker before visiting his neighbour on Tuesday. Playing online poker in no way causes or enables him to meet his friends (and probably even acts as a hindrance), and so can't be covered by the same verb phrase.

Single verb phrases can expand their descriptive scope, then, to include multiple contingently related events, which could alternatively be described by multiple verb phrases. This does not prove that multiple verb phrases can describe a single event, although it is strongly suggestive that the same interpretive conditions apply in the multi-verb case as in the single-verb case. Consider, for example, Fodor's generalisation that the causal relations expressed by lexical verbs must be direct. The same appears to be true in the multi-verb case. To see this, consider again (43a), repeated below.

(43a) John collapsed after colliding with a lamp post.

This sentence is true on the interpretation where colliding with the lamp post directly causes John's collapse. It is also true if the collision did not cause the collapse, but merely preceded it. The interesting case from the perspective of Fodor's generalisation is the one where the collision does cause John's collapse, but only indirectly. Such a scenario would be one where, for example, John staggered off after walking into the lamp post without collapsing, but badly shaken. So badly shaken, in fact, that he needed several drinks to calm his nerves. And after eight triple brandies, he collapsed in a sorry, inebriated heap.

It seems that the temporal relation among events expressed by *after* in (43a) cannot be enriched into a contingent relation in such a case. Some evidence supporting this claim can be found by considering the following exchange, in the above scenario.

(51) A: I know why John collapsed: he collapsed after colliding with a lamp post.

B: That's not true. It was the triple brandies that did it.

In (51), speaker A identifies a cause for John's collapse. However, the cause that he identifies is the remote cause, the collision with the lamp post. Speaker B can legitimately

take issue with this, and claim that the “real” cause (by implication, the only “real” cause) of John’s collapse was the brandy. This involves rejecting speaker A’s assertion as a false claim concerning the causal chain in question, with the implication that such an assertion in such a scenario will only be understood as true if the relation specified by *after* is understood in purely temporal terms, rather than in terms of (indirect) causation.

If this is accurate, we see a surprising parallel between the possibilities for pragmatic enrichment of relations among multiple verb phrases on the one hand, and the possible relations among events expressed within a single verb phrase on the other. In turn, this is strongly suggestive that the same event structures can be composed from either single or multiple VPs as required.

So, to summarise this section, we have seen some evidence suggesting that constituents larger than single VPs can describe single events. We also saw that there are semantic restrictions on single event construals. A family of *contingent relations* was proposed and two members of that family (perhaps the only two members) were described. It was claimed that the only admissible relations among subevents in the same macroevent are contingent relations, a claim we return to in more detail in the following section.

2.5 The Effect of Agentivity

2.5.1 Planning and Enablement

In the previous section, we noted an asymmetry between the two contingent relations of causation and enablement. This section will concentrate on a further difference between the two, and relate this difference to a distinction pertaining to agentivity. The overall effect we observe is that an agentive subject permits the formation of larger macroevents, in some cases, than is otherwise possible. This will be corroborated by experimental evidence detailed in Wolff (2003).

In section 2.4, we saw that enablement differed from causation in that the former was modal: a cause necessarily produces an effect in the most accessible possible worlds, but an enabling event does not necessarily lead to the enabled event.²⁷ However, there is another difference between the two, namely that, for linguistic purposes, the causal relation which

²⁷Technically, this just makes enablement “more modal” than causation, as there are inaccessible possible worlds in which a cause occurs without producing the relevant effect. I stick to the less confusing terminology here, though, assuming that enablement is modal and causation is nonmodal.

appears to be relevant is direct causation, whereas we do not distinguish between direct and indirect enablement relations. In other words, for linguistic purposes, enablement, but not causation, appears to be a transitive relation.

We saw some evidence in sections 2.2 and 2.4 for the privileged status of direct causation over indirect causation in natural language, and I will take that as given here. However, if we attempt to apply similar tests to cases of enablement relations, we find that both direct and indirect relations are permitted among subevents of the same macroevent.

I will continue to assume that Fodor's generalisation (24) is correct, and so that any portion of stuff that happens that can be described by a single verb phrase must constitute a single event. Now, what if that single event consists of three (or more) subevents at the relevant level of granularity, all related by enablement relations? In that case, a construal of the subevents as related directly by enablement relations is unavailable. If such a portion of stuff that happens can be covered by a single verb phrase, and therefore can constitute a single macroevent, then we must conclude that subevents related by *indirect*, as well as direct, enablement relations can be contained within a single macroevent.

It is actually quite hard to find clear examples of this configuration, as the notion of *the relevant level of granularity* remains a primarily intuitive one. However, the following seems to me a plausible example.

- (52) John is walking to the outdoor pursuits shop. A friend asks him where he is going.
John replies 'I'm going climbing'.

At one level, this should be false. He is walking to the outdoor pursuits shop. However, there is a chain of events which makes this a legitimate claim to make. Let us assume that he was walking to the shop in order to buy something, maybe carabiners. He then intended to use the carabiners to help him climb a rock face. We have, then, three events: (a) the walk to the shop; (b) the purchase of carabiners; (c) the climb. Moreover, it seems that, at any level of granularity, none of these events can reasonably be omitted. (a) and (c) cannot be omitted, because they represent the current state of affairs and John's stated goal, respectively. But (b) cannot be omitted because walking to the shop is only usually related to climbing if something happens in the shop which influences the likelihood of the climbing happening — the fact of going to the shop on its own does not make climbing any more or less likely. So we have three subevents. And each of these enables the next: going

to the shop does not cause John to buy carabiners, but it does make it more feasible, and likewise for owning carabiners and going climbing. So (a) enables (b) and (b) enables (c). But that means that the enablement relation between (a) and (c) is indirect, according to the definition of directness in (26). Yet this does not remove the possibility of construing these three events as a single macroevent, as they are described by a single verb phrase, *going climbing*, in (52).²⁸ We must, then, claim that enablement differs from causation in that indirect enablement, but only direct causation, is relevant to linguistic generalisations such as (24).

So why should this be? I believe that it is linked to a further difference between causation and enablement, hinted at in the previous section, which is this.

(53) Enablement relations form plans

Enablement relations can only be seen by, or attributed to, an agentive subject, who forward-chains events standing in such relations to form plans.

In other words, causation is a relation concerning how events relate to each other in the world at large. But enablement is a relation concerning how *an agent perceives* events as relating to each other in the world at large, and how he hopes to chain these events together to form a plan. Whereas causation is simply a relation between events, then, enablement is a relation between a set of events and an individual, the agent who chains those events together into a plan.

This is only any use if we have a definition of *agent*. And in linguistics, the usual problem is that we have not one, but several, available definitions of *agent*, which agree on a few core cases but differ widely in their scope. I will not go over the many and varied options available in the literature, but rather assume the following without discussion:

(54) An *agent* is a rational actor acting with the intention of reaching a specific goal.

Key to the notion of agentivity, on this definition, is the notion of goal-driven behaviour. These goals can be short- or long-term. For example, John could be walking just for the sake of walking, in which case his goal is immediately fulfilled (and fulfilled in an ongoing way) by the action he is currently performing. Or John could be walking in order to get to

²⁸It is not clear to me, though, why we must say *I'm going climbing*, or *I'm climbing today*, for example, rather than simply *I'm climbing*.

the shops in order to buy some carabiners in order to go and climb Kilnsey Crag. In either case, John is an agent and so enablement relations are available to him.

If, on the other hand, John is not acting in a goal-driven way, it is wrong to say that any intermediate event *enabled* him to end up wherever he ended up. To see a concrete example of this, let's try a thought experiment. Assume that John's actions are exactly the same as above (walking, outdoor pursuits shop, carabiner-buying, climbing) but that he didn't mean to perform any of those actions. He was on his way to the chip shop next door, but stumbled into the outdoor pursuits shop by mistake. Once he was there, he figured he may as well make the most of it and buy some Kendal mint cake, but somehow he found himself buying carabiners instead of Kendal mint cake. By this time, he was feeling quite puzzled and more than a little foolish, but he decided he should at least make sure the carabiners have a good home, so he would give them to his friend, who lives at the bottom of Kilnsey Crag and likes climbing. But when he got there, some unknown force came over him, and rather than ringing his friend's doorbell, before he knew it he was using the carabiners himself, attached to a rope halfway up Kilnsey Crag. Now, when, in these circumstances, could John truthfully say *I am going climbing*? When he was intentionally going climbing, he could truthfully say it as soon as he started on the chain of enabling events. When he only unintentionally found himself climbing, though, although his actions were the same at every stage, it could only truthfully be said when he finds himself attached to a rope halfway up Kilnsey Crag.

It seems, then, that an agent acting in a goal-driven way allows us to form larger macroevents than we can form in the absence of such an agent. In fact, a series of papers in recent years have drawn attention to the central role of plans and goals in the delimitation of events. These papers have spanned a subject area ranging from psychology and cognitive science (Zacks and Tversky 2001, Wolff 2003) to computational semantics (Moens and Steedman 1988, Steedman 2005, van Lambalgen and Hamm 2005), each work arriving at similar conclusions for independent reasons. In the next subsection, I will present one piece of corroborating experimental evidence here, coming from a set of experiments reported in Wolff (2003).

2.5.2 Wolff's Results

In his 2003 paper, Wolff reports a series of experiments designed to elucidate the relationship between agentivity and event structure. In particular, he aimed to test the validity of the *no-intervening-cause criterion* and the *no-intervening-cause hypothesis*, given below.²⁹

No-intervening-cause criterion

'Direct causation is present between the causer and the final causee in a causal chain (1) if there are no intermediate entities at the same level of granularity as either the initial causer or final causee, or (2) if any intermediate entities that are present can be construed as an enabling condition rather than an intermediate causer.' (Wolff 2003:4–5)

No-intervening-cause hypothesis

'The linguistic coding of causal chains in English (and possibly in other languages) is determined by the concept of direct causation as defined by the no-intervening-cause criterion. Further, the way in which English speakers (and possibly speakers from other languages) individuate events is also determined by the concept of direct causation as defined by the no-intervening-cause criterion. In terms of linguistic coding, the no-intervening-cause hypothesis holds that in the absence of an intervening cause, a causal chain can be described by a single-clause sentence. In terms of events, the hypothesis holds that when there is no intervening cause, a causal chain can be construed as a single event.' (Wolff 2003:7)

The first part of the no-intervening-cause criterion, and all of the no-intervening-cause hypothesis, should look familiar from several works on causation and the individuation of events discussed above, such as Lewis (1973), Bittner (1999) and Fodor (1970). The interest, for our purposes, comes from the notion of *enabling condition* in part (2) of the definition of the no-intervening-cause criterion, making use of a very similar notion of enablement to that discussed in section 2.4 and in the foregoing part of this section. Wolff notes that it is clear that we make at least an intuitive distinction between causation and enablement, despite nonmodal cases of enablement relations (i.e. cases where both events actually occurred) falling together with causation under counterfactual, causal chain-based definitions of the latter such as Lewis' (1973). We can tell this from the fact that the English verbs *cause* and *enable*, taken to at least approximate these two relations, are appropriate in different circumstances.

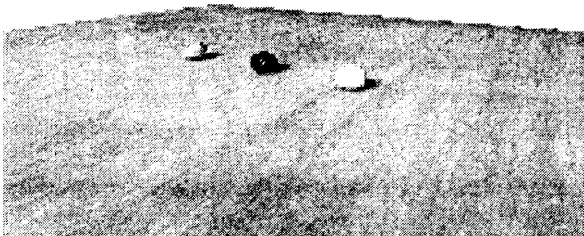
²⁹The terminology in the definitions given below is copied *verbatim* from Wolff's paper, and in some cases is at odds with how these terms are used elsewhere in this thesis. In particular, Wolff's conception of *direct causation* is much broader than mine, and subsumes relations of both enablement and direct causation, in my terms.

- (55) a. The explosion caused the windows to shatter.
b. # The explosion enabled the windows to shatter.
- (56) a. Gasoline enables cars to run.
b. # Gasoline causes cars to run. (Based on Wolff 2003:7–8)

Although Wolff describes the relations of causation and enablement in terms of a theory of force dynamics based on Talmy (1988) and Jackendoff (1990), all the results that he reports are equally compatible, as far as I can see, with the approach taken above. I assume, crucially, then, that enablement relations are only available in the presence of an agent. This would give us an instant explanation for the observations of Talmy (1988) and van Valin and Wilkins (1996) that ‘many languages allow complex causal chains to be summarised by mere expression of the initial causer and final result, with the intermediary events left implicit, when the causer is sentient,... [so] a sentient causer may stand in for an entire sequence of events leading up to a result’ (Wolff 2003:15), for example.

Wolff’s first experiment tests the relatively uncontroversial case where there are no enablement relations to consider, and so direct causation is present only if there are no intermediate causes. Subjects were shown animations involving three marbles, as in the still below, from Wolff (2003:16), each of which rolled into the next in succession, each causing the motion of the next.

(57)



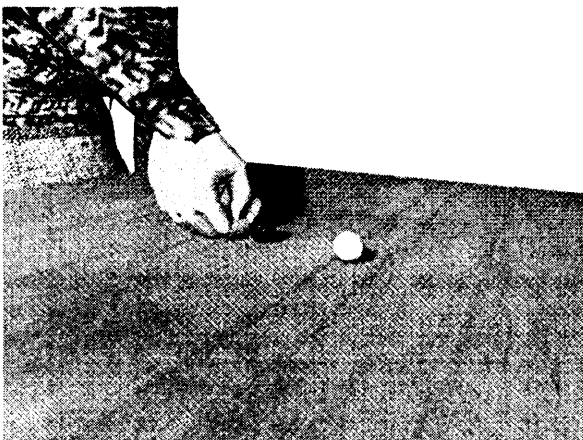
There were therefore two unmediated causal chains, between the first and second, and second and third marbles; and a mediated causal chain, between the first and third marbles, with the second as an intermediary. As all participants in the causal chain are non-sentient, there is no question of this mediated causal chain representing an instance of direct causation (in Wolff’s sense), and so the presence of an intermediary forces the causal relation

to be indirect. As they are throughout this series of experiments, the claims of the no-intervening-cause criterion regarding Wolff's definition of direct causation are approached through the predictions of the no-intermediate-cause hypothesis, namely that direct causation (or a single macroevent, in my terminology) will allow lexical causative use and perception of a single event (while not necessarily blocking periphrastic, biclausal causative use or perception of multiple events). In that case, if subjects are asked to describe the interaction between either the first and second, or the second and third marble, with one of the two forms in (58), either option should be available. Equally, subjects should be able to perceive the interaction of either of these pairs of marbles as a single event. On the other hand, if asked about the relation between the first and the last marbles, only the periphrastic causative (58b) and a perception of two or more events should be possible. The observed data matched these predictions to a statistically significant extent.

- (58) a. The red marble moved the blue marble.
 b. The red marble made the blue marble move.

This suggests that, when no sentient causers are involved, direct causation requires the absence of any intermediaries in the causal chain. Experiment 2 contrasts this finding with the case where the initial causer is sentient — a picture of a human hand was used in place of the first marble, as in (59), reproduced from Wolff (2003:16).

(59)



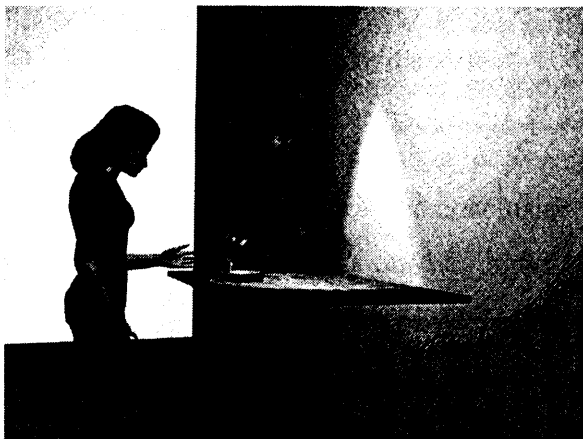
We now predict that, in the case where the hand moves a marble, which subsequently causes another marble to move, a sentence like (60a), the analogue of (58a), should now be acceptable to describe the effect of the hand on the second marble, as well as (60b), as

the first marble could be seen as enabling the human to bring about the second marble's movement. Again, the results supported the prediction to a statistically significant extent.

- (60) a. The man moved the blue marble.
b. The man made the blue marble move.

Finally, experiment 3 showed that more than sentence was at issue in the definition of direct causation. Pairs of animations were prepared which differed in that the sentient initial causer apparently intends to bring about the final result state in one, but not in the other. For instance, one pair consists of a woman waving her hand towards smoke rising from an ashtray, and a woman walking past smoke rising from an ashtray, as in (61), from Wolff (2003:22).³⁰

- (61) a.



- b.



³⁰It must be remembered that these images are only stills from an animation, and so the reader needs a bit of imagination to recreate the whole animation.

In both cases, the smoke disperses, but only in the former case is this an intended consequence of the woman's actions. Only in the former case, then, is the woman behaving agentively, making enablement relations available for macroevent formation. Furthermore, if we are to perceive a causal relation between the woman's actions and the smoke dispersing in (61b), we arguably need to consider an intermediate causal event (the woman creates a draught), thereby blocking a relation of direct causation between the woman's movement and the smoke's dispersal. In other words, neither causation nor enablement relations allow us to construe the whole sequence as a single event. As predicted, then, subjects were more willing to use lexical causatives, for example as in (62a) as opposed to (62b), and perceived a single event more readily, for the intended scenarios than for the unintended cases.

(62) a. The woman dispersed the smoke.

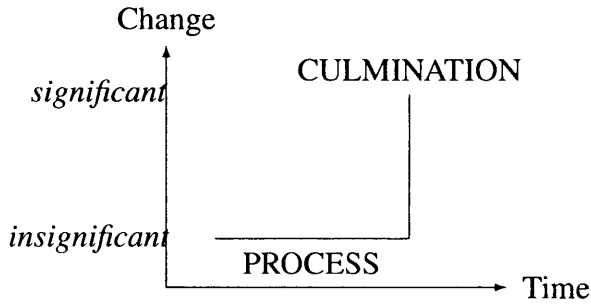
b. The woman made the smoke disperse.

These experiments clearly support the conclusion that perception of an action or series of actions as goal-oriented increases our willingness to admit larger portions of those actions as a single event.³¹ Equivalently, people accept a more coarse-grained representation of a portion of stuff that happens if they recognise those happenings as being motivated by, and enabling, an agent's attempt to reach a remote goal. Or in other words, if the subject is an agent, macroevent formation can apply more expansively, exactly the same conclusion we reached above on independent grounds.

We now need to know how to fit this fact into our model of the internal structure of events, which currently consists only of the rather primitive *maximal core event* represented in (32), repeated below.

³¹Ad Neeleman points out a further prediction of this approach, namely that the same animation *could* be construed as part of a single event, if it formed part of a larger scenario which was within the planning of an agent. For example, if we were in a zoo where the favoured mechanism of smoke dispersal involved letting a herd of angry rhinoceri charge down a corridor past the offending ashtray, then we predict that an animation which was longer than (61b), but which included a subpart analogous to (61b) only with the herd of rhinoceri substituted for the woman, then we should be able to perceive this as a single event, and describe it by, for example, *the zookeepers dispersed the smoke*. My intuitions are that this goes in the right direction, but unfortunately, it is a prediction which was not tested by Wolff.

(32)



Clearly, the relation between the two components of this core event is insufficient to cover the full range of enablement relations discussed above. For example, in a sentence like (63), we may wish to consider the accomplishment described in the matrix VP as forming a single macroevent with the remote goal expressed in the *in order* clause. However, as the matrix event already consists of a fully specified process and culmination, the goal of communicating his inner rage cannot be identified with either of these components.

(63) John drew a picture in order to communicate his inner rage.

For this reason, I introduce the notion of an *extended event*, as defined in (64).

(64) An extended event consists of a series e_1, \dots, e_n of core events, such that:

- a. e_1 occurred and is agentive;
- b. The agent of e_1 intends e_n to occur;
- c. For every e_k , $1 \leq k < n$, either e_k causes e_{k+1} or the agent of e_1 believes that e_k enables e_{k+1} .

An extended event, then, consists of a series of core events, the first of which is actually performed by an agent who intends the last event in the sequence (the remote goal) to occur. We have amassed plenty of evidence that an extended event is still a single event, however, and unproblematically so, given the evidence discussed in section 2.2 that events come in variable sizes.

We also make a further prediction that extended events can never be formed on the basis of states, although they can feature states as remote goals.³² This is because states are,

³²States should also be able to feature as intermediate events, although I do not have any clear examples of this.

almost by definition, nonagentive. It seems (as first noted, I believe, by Barbara Partee) that some states start to behave like activities if their subject is agentive. So states do not usually form a progressive, as shown in (65). Adjectival states, at least, allow a progressive form, but only with an agentive, deliberate reading which is obligatorily absent if the progressive is absent (66).³³ As the ability to take the progressive is the criterion distinguishing states from activities for Vendler, it appears that adding agentivity converts a state into an activity.

(65) *John is knowing the answer.

(66) a. John is annoying. [nonagentive]

b. John is being annoying. [agentive]

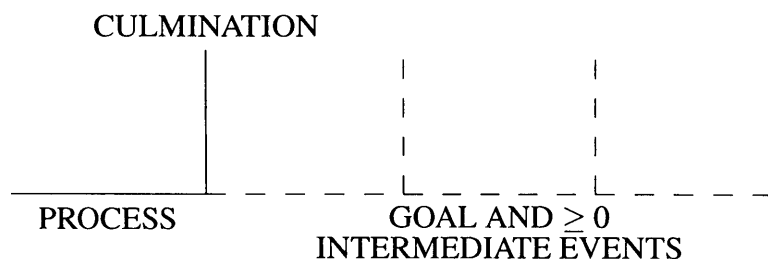
If states are nonagentive, then we also predict that they cannot appear as the initial subevent in an agent's plan. Accordingly, it should not be possible to modify them with *in order* clauses, which describe the initial and final subevents of just such a plan. This prediction is borne out, most strikingly by minimal pairs such as the following. Only when *be* is added in (67b) to form an activity from a state does the sentence become felicitous.

(67) a. *John is annoying in order to make his brother laugh.

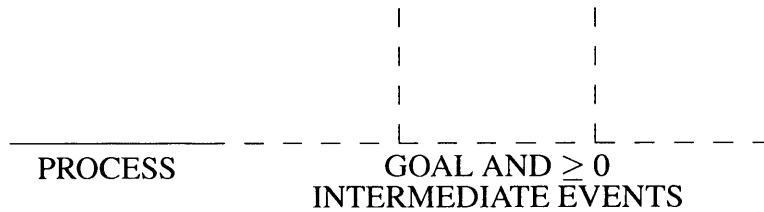
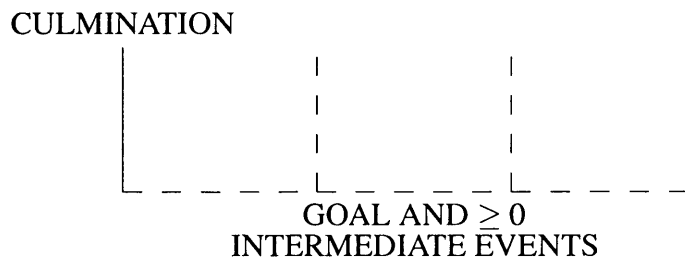
b. John is being annoying in order to make his brother laugh.

We have, then, three subclasses of extended events (although the differences between them will not prove to be significant in this thesis), built around an initial event consisting of a process, a culmination, or both. These three classes are represented pictorially in (68).

(68) a. **Extended culminated process:**



³³Why this should only apply to states described by copula + adjective is beyond me.

b. Extended process:**c. Extended culmination:****2.5.3 Agentivity, Aspectual Classes, and the Progressive**

It is appropriate here to illustrate a further way in which agentivity interacts with event structure, namely that it offers a new perspective on the question of whether or not to consider accomplishments and achievements as separate aspectual classes. Both positions have well-established pedigrees within the literature. The two classes have been considered as distinct since Vendler (1957), but there also exists an older tradition, apparently stemming ultimately from Aristotle, in which they are not distinguished. For more recent discussion, see Dowty (1979) and Parsons (1990), following Vendler, and Mourelatos (1978) and Verkuyl (1989), following Aristotle, among many others in both cases.

Usually when two distinct positions coexist in the literature for a long period of time, this is because there is at least a grain of truth in both, and this is what I wish to say is the case here. As will have been clear from section 2.3, I wish to place myself in the latter tradition, but I think that we cannot deny, following the discussion in that section, that for all the similarities between accomplishments and achievements, there remains at least one clear difference.

We showed in section 2.3 that progressives can be formed from many Vendlerian achievements. However, we also hinted there at an interpretive difference. Progressives formed from achievements have only a “prospective” interpretation, according to which the culmi-

nation specified by the achievement is imminent, in some sense. Meanwhile, progressives formed from accomplishments are acceptable even when the culmination is quite remote. For instance, as mentioned in footnote 14, and elaborated earlier in this section, it is legitimate to claim to be climbing a mountain (usually considered an accomplishment) before you have even taken a step towards the top, but not legitimate to claim to be reaching the summit (a paradigm case of an achievement) until you are really almost there.

Now, what distinguishes climbing a mountain from reaching a summit, in terms of the tools we have at our disposal? The most obvious distinction is that the preparatory process of *climb a mountain* consists of a series of agentive activities — preparing equipment, planning routes, travelling to the foot of the mountain, and so on, carried out with the intention of climbing that mountain. Meanwhile, the preparatory process of *reach the summit* consists of approaching a particular location, which is not an agentive activity — a piece of wood could reach a summit as easily as a human could, if it was blown there by a strong wind or carried by an unsuspecting goat.

In the terms of this section, then, accomplishments involve agentivity, and so can take the form of extended events, while achievements are characterised as nonagentive, and therefore do not have extended events available to them.³⁴ This explains why progressives of accomplishments, but not achievements, are acceptable when the culmination is remote. In the achievement case, the progressive and the culmination must be part of the same core event, whereas in the accomplishment case, they must only be part of the same extended event, a requirement which imposes a much looser restriction on their temporal proximity. This explains why the implication that the culmination is reached is cancelled so much more readily with the progressive of an accomplishment, than of an achievement.

(69) a. I was climbing the mountain, but I stopped.

b. #I was reaching the summit, but I stopped.

In the accomplishment case, we are willing to accept reaching the summit as a remote goal of climbing the mountain, related to it as part of an extended event. However, we are also willing to accept that people's plans change, and that the remote goal of this extended

³⁴The relevance of agentivity for Vendler's distinction between accomplishments and achievements had been noted already in Verkuyl (1989), and to some extent in Pustejovsky (1991). However, Verkuyl collapsed the two classes completely, while Pustejovsky later (1995) adopted an alternative approach to the distinction in terms of *event headedness*, a notion I will not discuss here.

event may never be reached if that is the case. In the achievement case, on the other hand, the progressive is licensed not by a remote goal, but by “inertia” (in a sense clearly related to the *inertia worlds* of Dowty 1979), and we are consequently much less willing to accept that things didn’t turn out as they should have, unless we are given good reason, as in (70).

- (70) I was just reaching the summit, but a particularly unfriendly bunch of hikers blocked my way, and I never made it.

Distinguishing between accomplishments and achievements purely in terms of agentivity allows a further prediction which is beyond the reach of a purely event-structural approach to this distinction. This relies on the fact that, although achievements are apparently always nonagentive, as shown by the semantic clash with the agent-oriented adverb in (71), at least some “accomplishments” (according to the traditional Vendlerian classification) are typically agentive but can, in some cases, be nonagentive. And still other accomplishments are necessarily agentive. This is illustrated for *destroy*, in (72), which contrasts with the necessarily agentive *play* in (73).

- (71) a. * John deliberately died.
 b. * John deliberately arrived.³⁵
 c. * John deliberately reached the summit.
- (72) a. John deliberately destroyed the house.
 b. John unintentionally destroyed the house.
- (73) a. John deliberately played a Schubert scherzo.
 b. ✗ John unintentionally played a Schubert scherzo.

Although (73b) is grammatical, and easily interpretable, the interpretation we arrive at is one where John intended to play *something*, but not the Schubert scherzo. Maybe he sat down to play a Schumann sonata, but the wrong music had been put on the music stand, and he didn’t realise. John was acting agentively in (73b), then, even if the result wasn’t

³⁵Do not be put off by examples such as *John deliberately arrived late*. We will see in section 3.4 that *deliberately* modifies only *late* in cases such as this.

the one he intended. In contrast, in (72b), John didn't necessarily intend to do anything. He could have fallen asleep with a cigarette in his mouth and burnt the place down.

There appears, then, to be a contrast between canonical accomplishment verbs like *play*, which require an agentive subject, and verbs like *destroy*, which are less fussy in this respect. A Vendlerian approach would automatically class both of these as accomplishments, and a sentence such as (72b) would therefore be a nonagentive accomplishment. On the approach taken here, though, a nonagentive accomplishment is a contradiction. An accomplishment is agentive, by definition, and an accomplishment with the agentivity removed becomes an achievement.

Strikingly, then, whereas Vendler treats aspectual class as a lexical property of the verb (or, on a more charitable reading in view of the objections in Verkuyl 1993 and elsewhere, as a function of the lexical items making up the VP), lexical entries underdetermine the accomplishment–achievement divide on the theory advanced here. Exactly the same sentence can be an accomplishment in one case, and an achievement in another, depending purely on whether the subject is construed as acting agentively or not.

In fact, this prediction appears to be borne out. If we accept that the best diagnostic of the accomplishment–achievement distinction that we have is that only achievements require the culmination to be imminent when used in the progressive, then we can show that the same sentence behaves sometimes like an accomplishment, and sometimes like an achievement, with respect to the progressive, depending on the agentivity of the subject. I will show this through a series of stories, starting in (74).

- (74) It had been a disastrous picnic, one which was really best forgotten. Tom clearly agreed with this sentiment, for he had picked up a nearby can of petrol and a box of matches, and was now approaching the leftovers with a look of steely intent on his face. 'What are you doing?', cried Bill. 'I'm destroying what's left of the food', said Tom.

Here, Tom is clearly behaving agentively with respect to a preparatory process for destroying the leftovers, namely bringing some petrol toward them with the intention of dousing them and setting them on fire. This is a remote goal — the food is not currently being destroyed, or even affected, by Tom's moving the petrol towards the leftovers. However, as the subject is acting agentively in this preparatory process, we predict that *destroy what's*

left of the food is an accomplishment in this case, and so the progressive can be used to describe such a remote action. This prediction is correct.

This contrasts with the cases in (75). In (75a), the subject is not behaving agentively — the alcohol has taken care of that. This means that the subject in these cases patterns with the nonsentient, and so by definition nonagentive, subject in (75b). As a nonagentive subject of a preparatory process defines an achievement, as opposed to an accomplishment, we predict that a use of the progressive in these cases is only felicitous if the arrival of the culmination point is imminent. As this is not the case in (75), the sentences are infelicitous.

- (75) a. It had been a gorgeous picnic, but with one drawback. Far too much alcohol had been involved. Most of the picnickers were now sleeping it off in the shade, with three exceptions, Tom, Dick and Harry. Tom was far from sober, and was amusing himself with a wayward, uncoordinated dance that was bringing him inexorably closer to the leftovers. Harry, who had stayed sober, surveyed the scene and frowned. ‘What’s wrong?’ asked Dick. # ‘Tom is destroying what’s left of the food’, said Harry.
- b. It had been a gorgeous picnic on the beach, but now it was time to leave. The picnickers had arrived at low tide, and placed their blanket near the shore, but the tide had turned, and now each wave came a little closer to the leftovers. Tom surveyed the scene and frowned. ‘What’s wrong?’ asked Bill. # ‘The sea is destroying what’s left of the food’, said Tom.

However, there is nothing inherently wrong with the progressive forms in (75). If these are progressives formed from achievements, we predict that they will be acceptable if the culmination is imminent, rather than remote as in (75). By shifting the context to one where the destruction is well underway, as in the cases in (76), we rescue the progressive sentences.

- (76) a. It had been a gorgeous picnic, but with one drawback. Far too much alcohol had been involved. Most of the picnickers were now sleeping it off in the shade, with three exceptions, Tom, Dick and Harry. Tom was far from sober, and was amusing himself with a wayward, uncoordinated dance that had landed him in the middle of the leftovers, which he was obliviously kicking about and trampling into the

earth. Harry, who had stayed sober, surveyed the scene and frowned. ‘What’s wrong?’ asked Dick. ‘Tom is destroying what’s left of the food’, said Harry.

- b. It had been a gorgeous picnic on the beach, but now it was time to beat a hasty retreat. The picnickers had arrived at low tide, and placed their blanket near the shore, but the tide was coming in with astonishing speed, and was now lapping around the leftovers, which the picnickers hadn’t had a chance to salvage. Tom surveyed the scene and frowned. ‘What’s wrong?’ asked Bill. ‘The sea is destroying what’s left of the food’, said Tom.

Clearly, then, the same sentence can come to pattern with accomplishments in some cases, and with achievements in others, purely on the basis of the agentivity of the subject. This offers clear support to the proposal that the accomplishment–achievement distinction belongs outside of the theory of aspectual classes, and instead in the domain of the interaction between agentivity and event structure. In this way, we see that, indeed, both the Vendlerians, aiming to show that the two classes are distinct, and the Aristotelians, hoping to prove that they are identical, were correct in a way.

To sum up this section, then, we have seen that an agentive subject allows macroevents to correspond to more inclusive portions of stuff that happens than would otherwise be the case. We attributed this to the transitivity of enablement relations and the intransitivity of direct causation, the only linguistically relevant causal relation. On the assumption that enablement is a relation between an agent and a set of events, such that the agent sees these events as forming a chain enabling him ultimately to reach a goal, we derive the link between agentivity and macroevent size.

This link was formalised through the definition of *extended events*, conceived of as a series of core events, each standing in a contingent relation to the next. We showed that such a definition also allowed us to recast the distinction between accomplishments and achievements in terms of agentivity, offering a third way in the decades-old debate concerning the unity or disunity of those two classes.

This marks the end of the elaboration of the definition of *event* that I will propose in this thesis. However, this means that we now also have a new set of units from which we can build larger structures. The following section investigates the formal possibilities for, and empirical necessity of, building larger semantic structures on the basis of the set of events

delimited in the previous few sections.

2.6 Further Expansions of Event Structure

2.6.1 Introduction

Over the past few sections, I have made a series of increasingly expansive proposals concerning the internal structure of events. I have now reached the end of that process. However, before we return to issues of locality, I want to pursue two interrelated goals in this section. The first is to demonstrate that, now that we have a well-defined and cognitively well-motivated set of event structures at our disposal, we are able to use the events that fit those structures as the atoms of higher-level grouping operations, such as set- or tuple-formation and summation. In fact, such higher-level structure is not only available in principle, but empirically necessary. I give two related pieces of evidence below concerning VP-modifiers to support this claim. One piece, based on Lasnik (1992) and concerning adverbs such as *alternately*, points to the conclusion that such modifiers cannot always be treated as predicates over single events, in anything like the sense of *event* defended in the rest of this chapter. The other piece of evidence concerns the behaviour of temporal PPs such as *on Friday* under VP-conjunction, and shows that we cannot adopt the simple theory of the interaction of tense and the event variable (as proposed, for example, in Higginbotham 1985), according to which tense existentially quantifies the event variable and situates it on a timeline with respect to the speech time.

Despite this latter piece of evidence, the second goal of this section is to show that there must be an upper limit on the syntactic level at which an event variable can remain λ -abstracted. The guiding intuition is that, at some point in the course of the syntactic derivation and the compositional semantic interpretation thereof, our concern switches from manipulation of possibly internally complex event descriptions to situation of those events in time. This means fixing the derived internal event structures once and for all and moving on to (neo-)Reichenbachian matters of the relationships between the *times* at which those events occur and the reference and speech times. As a consequence, manipulations of event variables such as those described in the foregoing sections are impossible above the point at which we make this shift from event structure to temporal structure. Looking ahead to our return to locality in the next chapter, this gives us a principled reason to expect syntactic

height effects in the locality data: intuitively, once we have moved on from the level of event structure to the level of temporal structure, there is no going back to perform the sort of manipulations which would be necessary to meet condition (18) and thereby allow extraction.

The structure of this section will be as follows. Firstly, as a way of approaching the more technical issues raised above, I give a brief recapitulation of some of Davidson's main reasons for the introduction of the event variable, and a recapitulation of Higginbotham's (1985) theory of the syntactic instantiation of such variables. As these reasons are to do with the representation of temporal modifiers, this leads naturally into a discussion of the second of the two problems sketched in this introduction, namely the interpretation of temporal modifiers in conjoined VPs. From there, we move to the related problem noted by Lasnik (1992), and a sketch of Lasnik's solution to it. An implementation of the basic intuition, integrated with Kamp's (1979) theory of a temporal structure built on events, is shown to offer solutions to both problems. Along the way, though, much comes to depend on the role of an operator *Op*, which shifts its argument from a simple predicate over event variables to a higher-order predicate over variables corresponding to sets of sets of events. In other words, there comes a point in the mapping from event structure to temporal structure at which we are dealing with different elements from the event descriptions characterised in the rest of this chapter. Luckily, this is precisely the conclusion we need to make our locality theory fly in the next chapter.

2.6.2 From Temporal Modifiers to Event Variables

The model of the syntactic encoding of events implied by the notions discussed in this chapter is characterised by the hypothesis, discussed in sections 2.2–2.4, that verb phrases relate in some way to a single event variable. For example, I have often used the intuitive term that a verb phrase *describes* an event. However, little has been said in two important respects. Firstly, we have not addressed the issue of exactly what the relation between such a constituent and an event is. Put differently, we have made no claims concerning the type-logical translation of the constituent consisting of a verb and its complement. Secondly, nothing has been said about how this constituent, and its denotation, are subsequently manipulated at higher levels in the syntax and compositional semantics. I will address both these concerns simultaneously in this section.

The starting point for consideration of these issues comes from Davidson's (1967) claim that events are ontologically individuals, and that the predicate at the heart of every 'action sentence' has a covert event argument in addition to the more regular, audible arguments. One of Davidson's pieces of evidence supporting this position comes from the relations between sentences such as the following.

- (77) a. Jones buttered the toast.
b. Jones buttered the toast in the bathroom.
c. Jones buttered the toast in the bathroom with a knife at midnight. (Davidson 1967:83)

The interest of these sentences is that each sentence lower on the list entails all the sentences above it. So (77b) entails (77a), and (77c) entails both of the above. The question is, how do we derive all of (77a–77c) while keeping a compositional interpretation procedure which ensures that all these entailments go through?

One solution which won't work is to assume that *butter* is a verb of variable adicity (along with, presumably, all other verbs in English). This approach would claim that, just as causative–inchoative *melt* can take either one or two nominal arguments, *butter* can take two, three, or five arguments, along with any number of other options. This is represented schematically in (78).

- (78) a. $[(77a)] = \text{butter}_2(\text{jones}, \text{toast})$
b. $[(77b)] = \text{butter}_3(\text{jones}, \text{toast}, \text{bathroom})$
c. $[(77c)] = \text{butter}_5(\text{jones}, \text{toast}, \text{bathroom}, \text{knife}, \text{midnight})$

The problem with this approach is that butter_2 , butter_3 and butter_5 , however similar they may look on the page, are logically independent predicates. The fact that I have chosen very similar names for these three predicates should not blind us to the fact that these names, if unsupported by a theory of *how* butter_2 relates to butter_3 and butter_5 , remain essentially arbitrary choices. Relating the truth of (78b) to that of (78a) is no more legitimate than making the truth of an arbitrary two-place predicate $P(a,b)$ contingent on that of an arbitrary

three-place predicate $Q(a,b,c)$. The deceptively similar names given to the verbal predicates in (78) cannot hide that fact.

Of course, anyone familiar with the work of Montague in the few years after Davidson's paper may say that such relations can be stipulated by meaning postulate, as in (79).

- (79) a. $MP1: \forall x \forall y \forall z. (butter_3(x, y, z) \rightarrow butter_2(x, y))$
 b. $MP2: \forall u \forall w \forall x \forall y \forall z. (butter_5(u, w, x, y, z) \rightarrow butter_3(u, w, x))$

However, seeing as we are facing an unlimited (at least in principle) number of adverbials modifying a given verb phrase, we would need a correspondingly unlimited number of meaning postulates for each predicate, a problem which gets even worse when we consider that similar postulates would need to be stated independently for every verbal predicate in the language. Our grammar would have to contain an infinite set of meaning postulates, which is clearly unworkable.

A second approach to the problem posed by (77) fails for similar reasons. This would be to assume that the verb *butter* unambiguously denotes, not a two-place predicate, but rather an n -place predicate, for some fixed n , with a pre-assigned slot waiting for every possible type of adverbial. If a given utterance contains an occurrence of the verb without its full complement of arguments (in a sense now expanded to include adverbials, which would be semantically nondistinct from arguments on this approach), then the unrealised argument positions would be existentially quantified over. If, for the sake of argument, we fix the number of argument slots at 5, this would mean that the examples in (77) would be represented as follows.

- (80) a. $[(77a)] = \exists x \exists y \exists z. (butter(jones, toast, x, y, z))$
 b. $[(77b)] = \exists x \exists y. (butter(jones, toast, bathroom, y, z))$
 c. $[(77c)] = butter(jones, toast, bathroom, knife, midnight)$

We now have the entailments we want. It is quite legitimate to infer (80a) from (80b), and to infer either of these from (80c). However, there is no reason to limit the combined number of arguments and adverbials occurring with the verb *butter* to five, as we have, arbitrarily, here. As Davidson points out, we can expand (77c) further, by adding '...by holding it between the toes of his left foot', and it seems that any limit on the number of

possible such modifications is processing-based, rather than grammatical, in nature. In that case, this approach, too, bites the dust.

The novelty of Davidson's approach is that it allows a *finite* expansion of the argument structure of a given verbal predicate, which nonetheless creates the flexibility to allow an arbitrary number of modifiers of that predicate. Specifically, each relevant predicate has one more argument than traditionally assumed, corresponding to an event, often taken to be a subclass of individual. This additional argument position will eventually be existentially quantified, but included within the scope of the existential quantifier may be other properties predicated of the event variable, as in (81).

- (81) a. $[[(77a)]] = \exists e. (\text{butter}(\text{jones}, \text{toast}, e))$
 b. $[[(77b)]] = \exists e. (\text{butter}(\text{jones}, \text{toast}, e) \wedge \text{in}(e, \text{bathroom}))$
 c. $[[(77c)]] = \exists e. (\text{butter}(\text{jones}, \text{toast}, e) \wedge \text{in}(e, \text{bathroom}) \wedge \text{with}(e, \text{knife}) \wedge \text{at}(e, \text{midnight}))$

Other solutions to the problem of iterated modifiers are imaginable (the treatment of adverbials as identity-typed functions in classical Montague Grammar, properly reined in by meaning postulates, is quite distinct, and able to offer a better treatment of modal adverbials, for example), but Davidson's approach at least offers a clear improvement over earlier treatments of this problem.

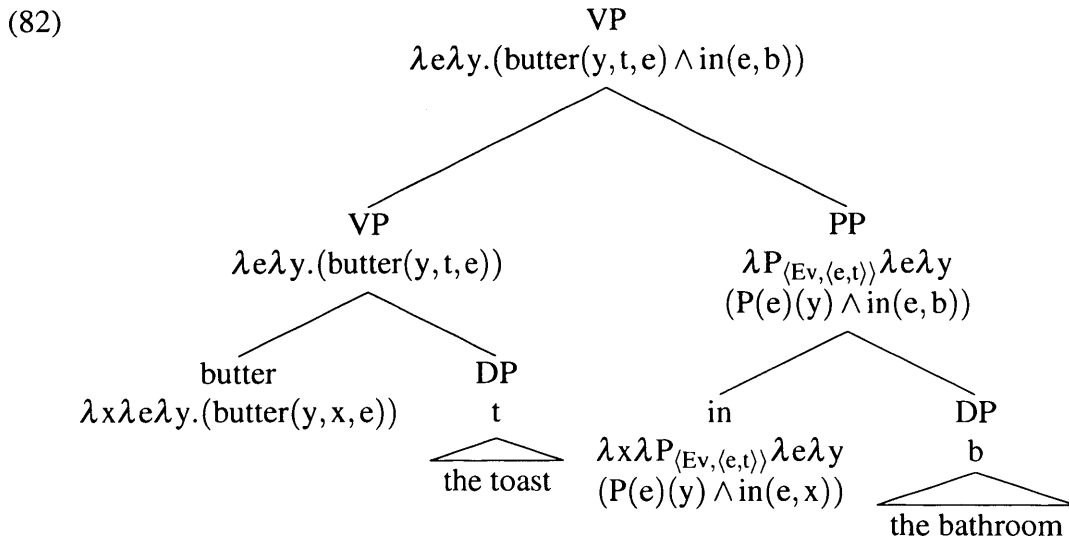
Although the syntax–semantics mapping is not a direct concern of his, Davidson's theory, particularly as spelt out by Higginbotham (1985), also provides a way of approaching the two questions raised at the start of this subsection. Higginbotham adopts Davidson's proposal wholesale, but also provides a simple theory of the relationship between semantic representations of sentences as assertions of the existence of events, and the syntactic structure of those sentences. The theory is summarised in the following quotation.

'[W]e can conjecture that the position *E* of the thematic grid of the verb is discharged at the point where VP meets Infl. The interpretation is existential generalization over the *E*-position.' (Higginbotham 1985:561)

This hypothesis can be broken down into two separate parts, assuming a semantics based on function application. Firstly, at the level of VP, the event position is still unsaturated. Secondly, one of the functions of Infl is to existentially quantify the event variable.

Although I agree with the first part, as will become clear shortly, things must be more complicated concerning the second part. This what the data concerning adverbial modifiers show.

Firstly, to show that the event variable is still abstracted at the VP level, all we need is something outside VP which ends up predicated of that variable. The sort of modifiers discussed by Davidson are cases in point. I assume an orthodox syntactic representation of the sentences in (77), according to which the adverbials modify a VP containing the verb and its complements. We may assume with Higginbotham that the event variable is introduced as part of the verbal head, and that it is λ -abstracted at this point, as it needs to be available for identification with the event variable introduced by a temporal modifier. As those modifiers are, by assumption, attached to VP, and as the denotations of the verb and the adverbials end up predicated of the same event variable, the event variable must still be λ -abstracted at that level, and existentially quantified at some later point in the derivation. Assuming for simplicity a Montagovian treatment of adverbials as identity-typed functors, this gives a representation of the VP portion of (77b) as follows, with the semantics of every node represented beneath its label. (77c) could, of course, be represented in a similar way, but it would use much more paper and not give any more insight.



We can provide, then, a fully compositional account of modification by such adverbials as the above if we make two assumptions, namely (i) that verb phrases denote predicates over events and modifiers represent higher-order functions over such predicates;³⁶ and (ii)

³⁶Alternatively, modifiers also represent predicates over events and combine with VPs by event identification in Kratzer's sense or by regular set intersection. Nothing would change for these purposes.

the event variable in the verb's denotation is still unsaturated at the VP level.

This provides a good reason to assume with Higginbotham that the event variable is unsaturated at the VP level. However, things are less simple for the other half of Higginbotham's proposal, namely that the event variable comes to be existentially quantified by T. Problems arise for this approach if we try and coordinate two VPs with temporal modifiers attached.

A simplistic rule for coordination (see Partee and Rooth 1983, Keenan and Faltz 1985 for much more detail) treats *and* as belonging to a family of related types, namely $\langle \alpha, \langle \alpha, \alpha \rangle \rangle$, for any α 'ending in *t*'. *And* would then operate by conjoining two constituents, and identifying the λ -abstracted variables from the two conjuncts. In the specific case of conjunction of regular VPs, with abstracted event and external argument variables, then, *and* would look like this.

$$(83) \llbracket \text{and}_{\text{VP}} \rrbracket = \lambda X_{\langle \text{Ev}, \langle e, t \rangle \rangle} \lambda Y_{\langle \text{Ev}, \langle e, t \rangle \rangle} \lambda e \lambda x. (X(e)(x) \wedge Y(e)(x))$$

In a regular case of conjoined VPs, as in (84), this works fine, giving us reasonable first-pass semantic representations like the following.

- (84) i. $\llbracket \text{eat fish} \rrbracket = \lambda e \lambda x. (\text{eat}(x, \text{fish}, e))$
 ii. $\llbracket \text{drink wine} \rrbracket = \lambda e \lambda x. (\text{drink}(x, \text{wine}, e))$
 iii. $\llbracket \text{eat fish and drink wine} \rrbracket = \lambda e \lambda x. (\text{eat}(x, \text{fish}, e) \wedge \text{drink}(x, \text{wine}, e))$

The problem comes when we add a temporal adverbial to each VP prior to coordination. As (85) shows, coordinating two such VPs leads to a representation in which a single event is taken to be located at two different times.

(85) John eats fish on Monday and drinks wine on Saturday:

- i. $\llbracket \text{eat fish on Monday} \rrbracket = \lambda e \lambda x. (\text{eat}(x, \text{fish}, e) \wedge \text{on}(e, \text{Mon}))$
 ii. $\llbracket \text{drink wine on Saturday} \rrbracket = \lambda e \lambda x. (\text{drink}(x, \text{wine}, e) \wedge \text{on}(e, \text{Sat}))$
 iii. $\llbracket \text{eat fish on Monday and drink wine on Saturday} \rrbracket = \lambda e \lambda x. (\text{eat}(x, \text{fish}, e) \wedge \text{drink}(x, \text{wine}, e) \wedge \text{on}(e, \text{Mon}) \wedge \text{on}(e, \text{Sat}))$

At the worst, this might indicate that a sentence such as (85) denotes a contradiction, because nothing can be on Monday and on Saturday (and in the present). In fact, given that the actual interpretation of *on* is up for grabs, and that we are adopting a flexible theory of event size, there is no reason to immediately rule out the existence of a single event covering both Monday and Saturday and consisting of a fish-eating and a wine-drinking. However, even if we admit that (85) does not in principle denote a contradiction, it is clear that it does not represent the meaning of the sentence accurately. This is because there is no way to get from the last line of (85) to an interpretation which associates the fish-eating specifically with Monday and the wine-drinking specifically with Saturday. We would end up with a truth-conditionally equivalent last line if we swapped the time adverbials around, as in (86).

(86) John eats fish on Saturday and drinks wine on Monday.

This will not do, clearly. In fact, though, there seems at first to be a simple solution to this problem. This involves assuming with Higginbotham that the event variable will eventually be bound by a tense head. We can then coordinate the conjuncts after the introduction of T^0 , by which point the event variables will have been bound separately within each conjunct. In that case, there is no possibility of interpreting the wrong adverbial as associated with the wrong VP, and (85) and (86) come out with different truth conditions, as (87) shows. I omit the details of the derivation, but reconstructing them should be straightforward.

- (87) a. $\llbracket (85) \rrbracket = \lambda x (\exists e_1. (\text{eat}(x, \text{fish}, e_1) \wedge \text{on}(e_1, \text{Mon})) \wedge \exists e_2. (\text{drink}(x, \text{wine}, e_2) \wedge \text{on}(e_2, \text{Sat}))) (j)$
- b. $\llbracket (86) \rrbracket = \lambda x (\exists e_1. (\text{eat}(x, \text{fish}, e_1) \wedge \text{on}(e_1, \text{Sat})) \wedge \exists e_2. (\text{drink}(x, \text{wine}, e_2) \wedge \text{on}(e_2, \text{Mon}))) (j)$

Something like this option needs to be made available for independent reasons, because of cases where the two conjuncts bear distinct tenses, as in (88).

(88) John moved here from Glasgow and lives in a bedsit.

It seems implausible that a single T^0 node should be able to assign both present and past tense, and so we must assume coordination above the T^0 level (but below the subject)

in an example such as (88). And this solves the basic adverbial attachment problem. However, issues remain. The most obvious one is that examples can be constructed involving coordinated VPs modified by time adverbials, which nonetheless are both c-commanded by a single element, which is itself no higher than T^0 . Two such cases involve auxiliaries, including modals, and negation.

On any regular account of the phrase structure of English, negation, whether VP-adjoined or situated in its own projection, occurs between the VP and T^0 — this is the reason underlying the classic *do*-support paradigm with negation (Chomsky 1955, 1957). And auxiliaries and modals may be taken as heading their own projection below T^0 , or as being generated in T^0 itself, but are certainly assumed never to be generated above T^0 . On the account given above, according to which coordinated VPs modified by time adverbials must be coordinated at or above the T' level, the prediction is clear: coordinated VPs modified by time adverbials, but jointly c-commanded by a single occurrence of negation of an auxiliary, should be impossible, or at least should give rise to the imprecise truth conditions seen above. This prediction is clearly false, as shown by examples such as the following:

- (89) a. **Negation:** John [didn't [[eat fish on Monday] and/or [drink wine on Saturday]]].
b. **Auxiliary:** John [has [[eaten fish on Monday] and [drunk wine on Saturday]]].
c. **Modal:** John [might [[eat fish on Monday] and [drink wine on Saturday]]].

The obvious conclusion to draw, then, is also the intuitive one, namely that coordinated VPs modified by time adverbials can nonetheless be reasonably represented as coordinated VPs,³⁷ and that there is something wrong with the specific implementation of the interpretation procedure sketched in (82–87).

2.6.3 *Alternately*

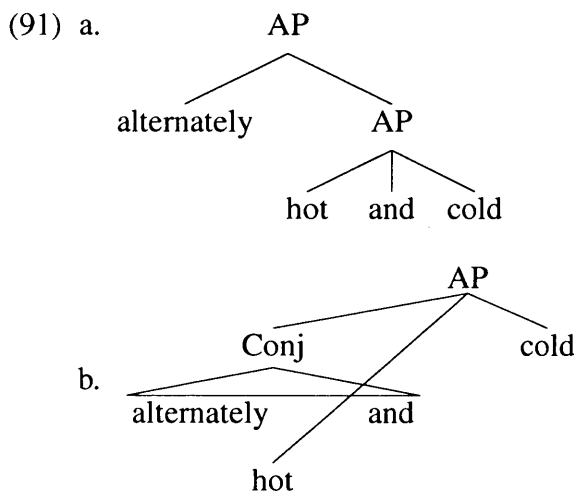
A related problem concerning a different class of modifiers was noted by Lasnik (1992). This time, the culprits are examples like the following.

- (90) The room was alternately hot and cold.

³⁷This is not to rule out coordination of larger constituents such as T' 's as well, which is necessary in cases such as (88) above, where the two conjuncts have different tenses.

If we assume that nothing is hot and cold at the same, then the adjective phrase *hot and cold* will necessarily have an empty extension at any single time. This is, of course, equally true for any other conjoined antonyms (*wet and dry*, *rough and smooth*, etc.), so, at the very best, we would predict *alternately hot and cold*, *alternately wet and dry*, and so on, to be truth-conditionally equivalent (at the worst, we may expect them to be trivially false of any subject). Lasersohn also argues convincingly that a semantics with fine-grained intensions built on properties as basic entities will not help us here.

In Lasersohn's words, the intuitive problem is that 'the adverb "needs access" to the times at which an object is hot and the times at which it is cold, in order to assure that these times are arranged in an appropriate pattern' (Lasersohn 1992:384), but there is no way for *alternately* to get that access on the basis of the denotation of the conjoined adjectives, taken together. One possible approach would then be to deny that the syntax of (90) is as in (91a), with the adverb modifying the conjoined adjectives, and to claim instead that *alternately...and* is a discontinuous conjunction, with direct access to the required conjuncts, as in (91b) (cf. Lasersohn 1992:385).



However, Lasersohn gives three pieces of evidence against the discontinuous conjunction approach. Firstly, there are cases, like (92), where the conjunction is apparently more deeply embedded than the adverb.

- (92) John's mood is alternately like that of a man who just lost his job and one who just won the lottery. (p.385)

Secondly, there are semantically similar cases which do not include *and*, as in the following (judgements are Lasersohn's).

- (93) a. John raised each of his fingers in alternation.
b. ? John alternately raised each of his fingers.
c. % John alternately raised his two hands. (p.386)

Both of these problems militate against the notion that the observed semantic pattern might be the work of a single discontinuous lexical item *alternately*... *and*. Finally, a complementary problem is shown by (94), which has an interpretation on which *very* scopes over both adjectives. This is just as we'd expect on a syntactic structure like (91a), where *very* may attach within the first conjunct or outside the conjoined APs. However, the possible wide scope of *very* remains a mystery on a structure like (91b)

- (94) Alternately very hot and cold

It seems, then, that the “access” to the individual conjuncts must be provided within the semantics, and cannot be directly reflected in the syntactic constituency.

Before presenting a sketch of Lasnik's solution to this problem, it may be instructive to clarify the nature of the similarity between the problem raised by *alternately* and that discussed in section 2.6.2. Both problems concern the way that a predicate holds through time. The type of predicates which occur within the scope of *alternately* are like those which are modified by PPs like *on Thursday* in that they hold of the subject at certain moments but not at others. The function of *alternately* is to state that the moments at which the two conjoined predicates within its scope hold of the subject are, roughly, in complementary distribution, while the function of *on Thursday* is to state that one time at which the predicate within its scope holds is on a Thursday. The problem which *alternately* poses is how to keep track of the set of moments when *hot* is true of the subject, and the set of moments when *cold* is true of the subject, when this information is apparently obliterated at the level of *hot and cold*. Similarly, the problem posed by examples like (89) is how to keep track of which time is associated with which event, even when all the event variables from all the conjoined predicates have been identified.

From here, the basic elements of the solution should be clear. In the case of *alternately*, two predicates are conjoined, and then modified. In the case of examples like (89), two predicates are modified, and then conjoined. In each case, we need to ensure that the things that are conjoined are somehow different from the things that are modified, and that the

way in which the larger units are composed of smaller units can be checked. For the sake of clarity, let us keep the name of *event* for the smaller units, associated with variables introduced by verbal (and possibly other) predicates. I will use the term *interval* to refer to the larger groupings.³⁸ The basic interpretations of the relevant examples are now as follows:

- (95) a. *The room is alternately hot and cold*: There is an interval containing temporally non-overlapping events, some of which are hot-room events and some of which are cold-room events.
- b. *John eats fish on Saturday and drinks wine on Monday*: There is an interval which contains at least two events, one of which is situated on Saturday and is a fish-eating event, and one of which is situated on Monday and is a wine-drinking event.

Formally, the point of this approach is to ensure that the variable which is associated with the larger grouping of conjoined predicates is distinct from the variables associated with any of the conjuncts. This allows us to “reach inside” an interval and recover the details of the events of which it is composed. Moreover, this is done purely semantically, without recourse to the sort of syntactic structure in (91b). However, as things stand now, we haven’t replaced Higginbotham’s simple theory of the syntactic instantiation of the event variable with a fully-fledged alternative, as we have not said anything about how, and where, these variables come to be existentially quantified. This is addressed in the rest of this section, where I will also spell out the formal details of the representations sketched in (95).

³⁸I will provide a theory of how events and intervals relate below, following, in essence, Kamp (1979). This deviates from Lasnik (1992), who refers to both the larger and smaller structures as events, but defines distinguished subclasses of events, the *simple* and *uniform* events, corresponding roughly to the smaller structures discussed here. An intuitively similar, but formally quite distinct, theory of *alternately* was proposed by Winter (1995). Winter proposes, in essence, that the word *and* doesn’t make any semantic contribution, but rather that an interpretation of two elements as conjoined comes from two freely available operations, *product introduction* and *generalised conjunction*. Product introduction forms a tuple $\langle \phi, \psi \rangle$, of type $a \bullet b$, from two expressions ϕ , of type a , and ψ of type b . Generalised conjunction then converts $\langle \phi, \psi \rangle$ into $\phi \sqcap \psi$. However, seeing as *and* does not make any semantic contribution, Winter can divorce the application of generalised conjunction from the occurrence of *and*, and claim that in the case of *alternately P and Q*, generalised conjunction does not apply and *alternately* operates directly on the members of the tuple. For my purposes, all that matters is that it is possible to distinguish the larger and the smaller structures semantically, and so I wish to steer clear of the ontological debate here, adopting something like Kamp’s set-theoretic notions as a matter of expository convenience rather than out of any conviction that they represent the right way to formulate these things.

2.6.4 Times and Events

A fundamental question concerns the relationship between events and time. The traditional view on this matter takes a densely ordered time line as a primitive, where an order is dense if (27), repeated below, holds.

(27) An order $<$ is *dense* iff $\forall x \forall y. (x < y \rightarrow \exists z. (x < z \wedge z < y))$

A defining characteristic of dense ordering, then, is that the notion of two elements of the ordering being immediately adjacent is simply unavailable. This reveals a clear difference between such an ordering and the relations of immediate precedence and direct causation among events described by Bittner (1999) and discussed in section 2.2. As noted in that section, the definition of a dense order in (27) and the definition of a direct relation in (26) are clearly mutually exclusive. The question then arises of the relationship between time and events. Occam's razor would lead us to hope to derive either event structure from temporal structure, or *vice versa*, if possible, and both these paths have been followed by many researchers. The former approach has been explored most thoroughly by Verkuyl (1993, 2000), who adopts a function constructing a discrete structure from the real-based time-line in which temporal intervals are defined, and then constructing an analogue of events from this discrete structure. However, I will follow Kamp (1979, 1981), and adopt the latter approach here. How much of what I have to say could be reformulated in Verkuyl's framework is an open question which I will not address here.

Kamp aims to derive temporal structure from event structure, and accordingly takes events as primitives. Kamp's approach operates on a set of events, over which two temporal relations are defined,³⁹ namely \propto (complete precedence, asymmetric, transitive, irreflexive) and \circ (overlap, symmetric, nontransitive, reflexive). We assume that for any two events e_1 and e_2 , either $e_1 \propto e_2$, $e_2 \propto e_1$, or $e_1 \circ e_2$, and moreover, that \propto and \circ are mutually exclusive. The full set of axioms governing the behaviour of \propto and \circ is as follows:

(96) A1. $\forall x \forall y. (x \propto y \rightarrow \neg y \propto x)$

A2. $\forall x \forall y \forall z. ((x \propto y \wedge y \propto z) \rightarrow x \propto z)$

³⁹Note that there is not a circularity in assuming temporal relations among events as primitives and then deriving similar temporal relations from the structural relations among those events. The primitive temporal relations \propto and \circ have to be seen as real-world antecedents of the conceptual temporal structure which is the concern of Kamp's theory.

$$A3. \forall x.(x \circ x)$$

$$A4. \forall x \forall y.(x \circ y \rightarrow y \circ x)$$

$$A5. \forall x \forall y.(x \propto y \rightarrow \neg x \circ y)$$

$$A6. \forall x \forall y \forall z \forall t.((x \propto y \wedge y \circ z \wedge z \propto t) \rightarrow x \propto t)$$

$$A7. \forall x \forall y.(x \propto y \vee x \circ y \vee y \propto x) \text{ (Kamp 1979:377)}$$

Call this structure $\varepsilon (= \langle E, \propto, \circ \rangle$, where E is a set of events). We can then define an *instant* of E as a set of pairwise overlapping events. Any set of events therefore generates a set of instants, as follows.

- (97) a. An *instant* of ε is a maximal subset of E of pairwise overlapping events, i.e., i is an *instant* of ε iff i) $i \subseteq E$; ii) for any $e_1, e_2 \in i$ $e_1 \circ e_2$; and iii) for any $e_1 \in E \setminus i$ there is an $e_2 \in i$ such that $\neg e_1 \circ e_2$.
- b. Let $I(\varepsilon)$ be the set of instants of ε .
- c. For $i_1, i_2 \in I(\varepsilon)$, $i_1 < i_2$ iff there are $e_1 \in i_1$ and $e_2 \in i_2$ such that $e_1 \propto e_2$. (Kamp 1979:378)

Kamp goes on to show that, for any $\varepsilon = \langle E, \propto, \circ \rangle$, the structure $\langle I(\varepsilon), <_\varepsilon \rangle$ is a strict linear ordering, which fits in with our intuitive conception of time. Moreover, it is not necessarily a dense ordering, but it *could* be. The potential denseness of the instant structure depends on the possibility of infinitely subdividing events — the finer grained the event structure, the more closely the instant structure approximates a dense ordering, as shown in detail in Kamp (1981). Given that there is no *a priori* lower bound to the fineness of the grain used in the individuation of events, the limiting case with an infinite number of minimal events will give a dense temporal order.

At this point, the intuitive notion of *e goes on at i* can be replaced by the set-theoretic notion $e \in i$. Speaking in terms of types, then, if events are of type Ev , then instants are of type $\langle Ev, t \rangle$. However, an event does not necessarily go on at only a single instant: it is possible for an event e_1 to overlap with two other events e_2 and e_3 , which do not themselves overlap (say, for concreteness, that $e_2 \propto e_3$). In that case, $I(\varepsilon)$ would contain two instants, both of which contain e_1 : $I(\varepsilon) = \{\{e_1, e_2\}, \{e_1, e_3\}\}$. We can then define an *interval* in which an event occurs as the set of instants i such that $e \in i$. Kamp shows (p.379) that such

an interval will always be a nonempty convex set of instants for any event. More generally, then, we may define an interval of $I(\epsilon)$ as simply any convex subset of $I(\epsilon)$:

(98) Int is an *interval* of $I(\epsilon)$ iff

- a. $\text{Int} \subseteq I(\epsilon)$;
- b. $\forall i_1, i_2, i_3 \in I(\epsilon). ((i_1 \in \text{Int} \wedge i_2 \in \text{Int} \wedge i_1 <_{\epsilon} i_3 <_{\epsilon} i_2) \rightarrow i_3 \in \text{Int})$.

If events are of type Ev and instants are of type $\langle \text{Ev}, t \rangle$, then, intervals must be of type $\langle \langle \text{Ev}, t \rangle, t \rangle$. All this is of interest to us because it seems that, within this model, we can maintain our assumption that verb phrases denote properties of single events, but make the additional claim that tense is defined relative to intervals, now defined as higher-order sets of sets of events. This is a natural claim, in view of the fact that the function of tense is to locate an event in time relative to some other point, and Kamp's temporal structure is expressed in terms of instants and intervals, rather than events.

This is also the point where the present theory differs most clearly from Higginbotham's. For Higginbotham, the variable which Infl existentially quantifies is the same as the variable introduced by the verbal head. Here, though, the two are quite distinct, and related through operations of set-formation. The rest of this section spells out a syntactic instantiation of this.

2.6.5 Events and Intervals in Syntax

We have seen that tense cannot be adequately described with respect to single events, on the conception of events defended in the rest of this chapter. It is equally clear that tenses can't be described simply with reference to instants, as sentences such as (89) make reference to two non-overlapping events in the scope of a single tense operator. Two non-overlapping events cannot help but give two instants, and the past tense operator must treat these two instants as distinct, just like the events that generated them. However, there is no obstacle to seeing these two instants as forming part of an interval which covers them both — there is, in principle, no limit to the temporal extent of an interval on the above definition. The simplest entities with respect to which tense relations can reasonably be described in Kamp's theory, then, are intervals, not instants or events.

At some point in the derivation, then, we may assume that the event variable is “closed off”, and the derivation proceeds through manipulation of instant and interval variables, with the tense operator working on intervals. I will make the specific assumption that an operator *Op* takes an $\langle \text{Ev}, \langle e, t \rangle \rangle$ argument (a VP, with or without adverbials), existentially quantifying over the event variable, and asserting that that event takes place at an instant which is, in turn, part of a (λ -abstracted) interval. The tense head will then locate that interval relative to speech time. Formally, *Op* will look like this.

$$(99) \llbracket \text{Op} \rrbracket = \lambda R_{\langle \text{Ev}, \langle e, t \rangle \rangle} \cdot \lambda \text{Int}_{\langle \langle \text{Ev}, t \rangle, t \rangle} \cdot \lambda x. \exists e. \exists i_{\langle \text{Ev}, t \rangle} \cdot (R(e)(x) \wedge e \in i \wedge i \in \text{Int})$$

We may then imagine a representation for the past tense like the following, which takes a predicate over intervals and an individual as arguments, identifies the individual as the subject of the predicate, and states that there exists an interval in which the predicate holds such that every instant in that interval precedes every instant containing the event (e_s) of producing the utterance in question.

$$(100) \llbracket T_{\text{Past}} \rrbracket = \lambda X_{\langle \langle \langle \text{Ev}, t \rangle, t \rangle, \langle e, t \rangle \rangle} \lambda x \exists \text{Int}_{\langle \langle \text{Ev}, t \rangle, t \rangle} \cdot (X(\text{Int})(x) \wedge \forall i_{\langle \text{Ev}, t \rangle} \cdot (i \in \text{Int} \rightarrow (\forall i'_{\langle \text{Ev}, t \rangle} (e_s \in i' \rightarrow i < i')))))$$

The other tenses will be represented in analogous ways. A straightforward derivation of a sentence such as *John ate fish* will now proceed as follows:

$$(101) \text{ a. } \llbracket \text{eat fish} \rrbracket = \lambda e \lambda x. (\text{eat}(x, \text{fish}, e))$$

$$\text{ b. } \llbracket \text{Op eat fish} \rrbracket = \lambda \text{Int}_{\langle \langle \text{Ev}, t \rangle, t \rangle} \cdot \lambda x. \exists e. \exists i_{\langle \text{Ev}, t \rangle} \cdot [\text{eat}(x, \text{fish}, e) \wedge e \in i \wedge i \in \text{Int}]$$

$$\text{ c. } \llbracket \text{ate fish} \rrbracket (= \llbracket T_{\text{Past}} \text{ Op eat fish} \rrbracket) = \lambda x \exists \text{Int}_{\langle \langle \text{Ev}, t \rangle, t \rangle} \exists i_{\langle \text{Ev}, t \rangle} \exists e. (\text{eat}(x, \text{fish}, e) \wedge e \in i \wedge i \in \text{Int} \wedge \forall i'_{\langle \text{Ev}, t \rangle} \cdot (i' \in \text{Int} \rightarrow (\forall i''_{\langle \text{Ev}, t \rangle} \cdot (e_s \in i'' \rightarrow i' < i'')))))$$

$$\text{ d. } \llbracket \text{John ate fish} \rrbracket = \exists \text{Int}_{\langle \langle \text{Ev}, t \rangle, t \rangle} \exists i_{\langle \text{Ev}, t \rangle} \exists e. (\text{eat}(j, \text{fish}, e) \wedge e \in i \wedge i \in \text{Int} \wedge \forall i'_{\langle \text{Ev}, t \rangle} (i' \in \text{Int} \rightarrow (\forall i''_{\langle \text{Ev}, t \rangle} \cdot (e_s \in i'' \rightarrow i' < i'')))))$$

Modification of a VP by a temporal adverbial will take place as before: the adverbial will simply locate the event in a given stretch of clock- or calendar-time (Tuesday, 5 minutes ago, etc.). When it comes to the interaction of *Op* and coordination, however, things

get more interesting. Assuming that *and* is unfussy about the types of the constituents it coordinates (so long as the types match), it is in principle possible to apply Op to each conjunct separately, and then conjoin them, or alternatively to conjoin them first and then apply Op to the conjoined VPs. In practice, though, the second option will always lead to problems, if both VPs are modified by incompatible adverbials.

To see why, let's walk through the two possible derivations for (85). The derivation in which conjunction precedes application of Op will proceed as follows:

- (102) a. $\llbracket \text{eat fish on Monday} \rrbracket = \lambda e \lambda x. (\text{eat}(x, \text{fish}, e) \wedge \text{on}(e, \text{Mon}))$
- b. $\llbracket \text{drink wine on Friday} \rrbracket = \lambda e \lambda x. (\text{drink}(x, \text{wine}, e) \wedge \text{on}(e, \text{Sat}))$
- c. $\llbracket \text{eat fish on Monday and drink wine on Saturday} \rrbracket = \lambda e \lambda x. (\text{eat}(x, \text{fish}, e) \wedge \text{drink}(x, \text{wine}, e) \wedge \text{on}(e, \text{Mon}) \wedge \text{on}(e, \text{Sat}))$
- d. $\llbracket \text{Op eat fish on Monday and drink wine on Saturday} \rrbracket =$
 $\lambda \text{Int}_{\langle \langle \text{Ev}, t \rangle, t \rangle} \cdot \lambda x. \exists e. \exists i_{\langle \text{Ev}, t \rangle} \cdot [\text{eat}(x, \text{fish}, e) \wedge \text{drink}(x, \text{wine}, e) \wedge \text{on}(e, \text{Mon})$
 $\wedge \text{on}(e, \text{Sat}) \wedge e \in i \wedge i \in \text{Int}]$

At this stage, the representation asserts the existence of an event which is on Monday and on Saturday. Furthermore, this event is a member of some instant *i*. But we know from (97) that instants are sets of pairwise overlapping events. What does it mean to overlap with an event which is half on Monday and half on Saturday? Do you have to overlap with both halves? With either? Things get worse if we consider the axiomatisation of \propto and \circ , the precedence and overlap relations defined over events, in (96). Two axioms are the following:

- (96) A1. $\forall x \forall y. (x \propto y \rightarrow \neg y \propto x)$
- A7. $\forall x \forall y. (x \propto y \vee x \circ y \vee y \propto x)$

What these tell us with respect to an event such as that in the last line of (102) is that such an event cannot just be half on Monday and half on Saturday, otherwise an event which took place on Thursday would both precede, and be preceded by, *e*, in violation of A1. Alternatively, we may some extra relation for “be surrounded by without overlapping”, but that would violate A7 and be intuitively unhelpful. So the only way to satisfy the axioms

is to assume that the event whose existence is asserted on the bottom line of the derivation in (102) stretches from Monday to Saturday, and any other event happening on Thursday, say, overlaps with it. But then we have to ask how we can verify that an event happening on Thursday is overlapping with an event consisting of something on Monday, something on Saturday, and a load of empty space in between. This is particularly true in view of the considerations discussed in section 2.2, which supported the claim that events must be spatiotemporally continuous, and subevents thereof must be appropriately related.

This is sufficient to rule out the representation in (102), if not as ill-formed, at least as trivially false and so pragmatically deviant. Nothing will be able to affect the falsity of the assertion of the existence of a single event which takes place half on Monday and half on Saturday.

We are left, then, with the alternative derivation of (85), according to which Op is applied to each conjunct separately before the two are conjoined. This derivation, at long last, succeeds. I omit the details here, but the end result will be the following

$$(103) \llbracket \text{John ate fish on Monday and drank wine on Saturday} \rrbracket = \\ \exists \text{Int}_{\langle \langle \text{Ev}, t \rangle, t \rangle} \exists e_1 \exists e_2 \exists i_1_{\langle \text{Ev}, t \rangle} \exists i_2_{\langle \text{Ev}, t \rangle} \cdot (\text{eat}(j, \text{fish}, e_1) \wedge \text{on}(e_1, \text{Mon}) \wedge e_1 \in i_1 \wedge i_1 \in \text{Int} \wedge \\ \text{drink}(j, \text{wine}, e_2) \wedge \text{on}(e_2, \text{Sat}) \wedge e_2 \in i_2 \wedge i_2 \in \text{Int} \wedge \forall i'_{\langle \text{Ev}, t \rangle} \cdot (i' \in \text{Int} \rightarrow (\forall i''_{\langle \text{Ev}, t \rangle} \\ (e_s \in i'' \rightarrow i' < i'')))))$$

So we now have a way to allow VP-coordination without the concomitant problems which were flagged up with respect to (85–86) at the start of this section. As flagged up above, the trick is to distinguish smaller units which can be modified by the temporal PPs, while simultaneously recognising a larger unit formed from the smaller units, which can form an input to the tense operator, auxiliaries, and so on. Here, the smaller units are events, and the larger units are intervals, or sets of sets of events, although other implementations would probably work equally well.

This architecture can also cope with the challenge posed by *alternately*, although the details given here differ significantly from Lasersohn's and Winter's accounts. We will assume that Op applies to each conjunct individually, to derive properties of intervals from properties of events within each conjunct separately. *Alternately* then denotes a relation between two properties of intervals, stating that these are both part of a larger subinterval

but do not overlap, as follows.⁴⁰

$$(104) \llbracket \text{alternately} \rrbracket = \lambda X_{\langle \langle \langle \text{Ev}, t \rangle, t \rangle, \langle e, t \rangle \rangle} \lambda Y_{\langle \langle \langle \text{Ev}, t \rangle, t \rangle, \langle e, t \rangle \rangle} \lambda x_e. \exists \text{Int}_1, \text{Int}_2, \text{Int}_3. (X(\text{Int}_1)(x) \wedge Y(\text{Int}_2)(x) \wedge \text{Int}_1 \subset \text{Int}_3 \wedge \text{Int}_2 \subset \text{Int}_3 \wedge \text{Int}_1 \cap \text{Int}_2 = \emptyset)$$

When the argument positions are filled in, then, and ignoring the precise contribution of present tense, we arrive at a representation like the following:

$$(105) \llbracket \text{The room is alternately hot and cold} \rrbracket = \exists \text{Int}_1, \text{Int}_2, \text{Int}_3, e_1, e_2, i_1, i_2. (\text{Hot}(\text{room}, e_1) \wedge e_1 \in i_1 \wedge i_1 \in \text{Int}_1 \wedge \text{Cold}(\text{room}, e_2) \wedge e_2 \in i_2 \wedge i_2 \in \text{Int}_2 \wedge \text{Int}_1 \subset \text{Int}_3 \wedge \text{Int}_2 \subset \text{Int}_3 \wedge \text{Int}_1 \cap \text{Int}_2 = \emptyset)$$

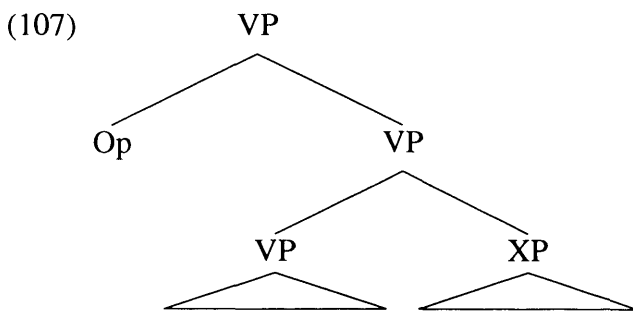
The general approach outlined above therefore allows a solution to both the problems raised against Higginbotham's simpler theory of the place of event variables in the syntax. One automatic consequence of this approach, and in particular of the introduction of Op, is that multiple verb phrases *can* describe a single event. In an example such as (102), nothing went wrong from a compositional view. Instead, it happened to be the case that the time adverbials forced a contradictory interpretation of the resulting structure. Without those time adverbials, it would have been quite legitimate to conjoin the VPs before or after embedding them under Op, resulting in single-event or multiple-event readings, respectively. If two VPs are conjoined before the introduction of Op, then, we arrive at a case where the two VPs jointly denote a property of a *single* event, exactly the sort of situation which section 2.4 led us to expect. We may, for example, arrive at an interpretation like the following, in a case where two conjoined VPs arguably describe causally related subevents of a larger macroevent.

$$(106) \llbracket \text{John Op (got drunk and fell over)} \rrbracket = \exists \text{Int}, i, e. (\text{get_drunk}(j, e) \wedge \text{fall_over}(j, e) \wedge e \in i \wedge i \in \text{Int} \wedge \forall i' (i' \in \text{Int} \rightarrow \forall i'' (e_s \in i'' \rightarrow i' < i''))))$$

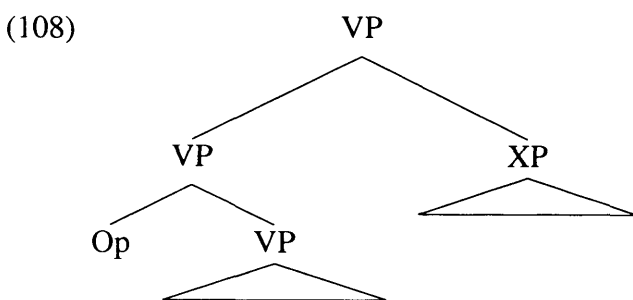
Moreover, this theory makes it clear that there is a *syntactic*, as well as a semantic and cognitive, limit to the possibility of conflating two subevents into a single macroevent.

⁴⁰This assumes that a single alternation is sufficient for *x* is *alternately p and q* to hold. The modifications if further alternations are deemed necessary are straightforward but tedious. Also, this definition of *alternately* does not impose any restriction on the temporal proximity of the two subintervals within which the two conjoined properties hold. There is brief discussion of this in Winter (1995), but I have chosen to ignore it here because it is irrelevant to the point at issue.

That limit is supplied, again, by Op. One consequence of including such an operator is that whatever is within the scope of Op must correspond to a single event, and anything outside the scope of Op cannot form part of the same event. Given that Op is assumed to merge only after a verb has merged with its internal arguments, but before T (which is now assumed to operate over intervals rather than events), that means that we expect syntactic height effects in matters of the delimitation of macroevents. We can distinguish three scenarios. In the structure (107), XP is adjoined to VP before Op is merged. As the complement of Op must describe a single event, this means that any λ -abstracted event variables contained within the denotations of VP and XP must be construable as subevents of a single macroevent.

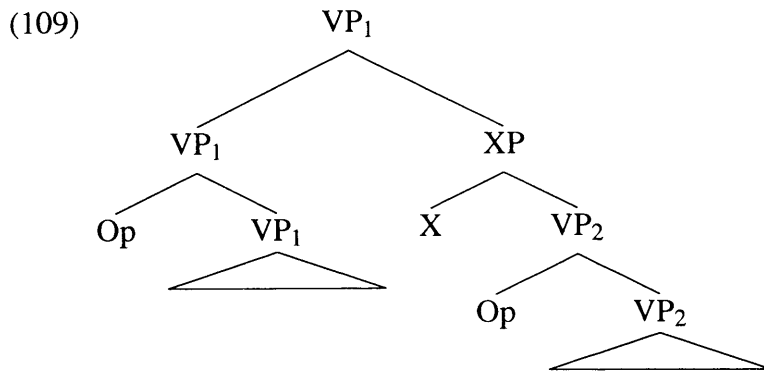


On the other hand, in (108), XP is adjoined after Op has merged. This is predicted to be semantically ill-formed if XP contains any λ -abstracted event variables, as XP is not in the scope of any Op head which could bind those variables.



There is a way to rescue a structure such as (108), however. If XP contains a nonfinite VP which introduces a λ -abstracted event variable, an Op merged within the adjunct will bind that variable, as in (109). We expect, then, that an adjunct can be merged outside the scope of an instance of Op c-commanding the matrix VP, but that the events described by the matrix VP and the adjunct cannot be construed as jointly forming a single macroevent

in that case.⁴¹



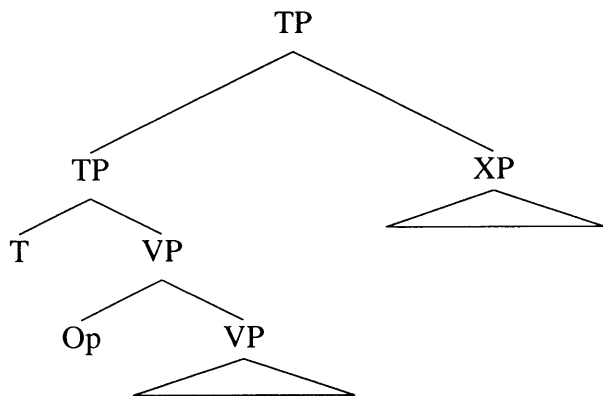
Given that Op, and often X, are phonologically null, we are, of course, essentially stating that a string consisting of a nonfinite verbal adjunct attached to a VP is structurally ambiguous, in a way which will lead to an ambiguity between single-event and multiple-event readings. The discussion in sections 2.2, 2.4 and 2.5 gives us some grounds for thinking that this is accurate in the case of nonfinite adjunct VPs. There is, however, a clear height effect predicted to occur when tense is involved. Given my comments earlier in this section about the interaction of temporal adverbials with auxiliaries and tense, it is natural to claim that auxiliaries and tense require an occurrence of Op within their scope. I will illustrate this with T below, but the same logic could be replicated for auxiliaries.

Recall that the semantics of T and Op given in this section requires that T have Op in its scope, which in turn has V in its scope. Op would bind V's event variable and introduce a λ -abstracted interval variable, which T would then bind. Accordingly, if a T node intervenes between the two verbs, we expect either semantic ill-formedness or a multiple event reading.

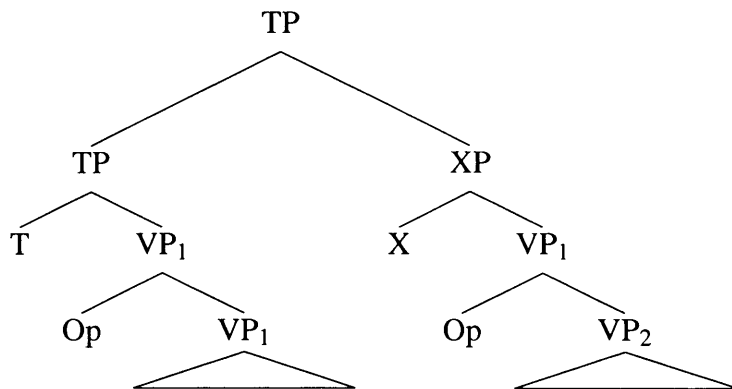
There are two subcases of this. In the first, a nonfinite verbal adjunct is adjoined above T, as in (110).

⁴¹A further possible structure is found when multiple copies of Op appear on the same projection line. Each one binds the abstracted event variable in its scope, but a higher copy is still legitimate if a further event variable is introduced outside the scope of the lower Op. This quite legitimate configuration is found, in essence, in regular tensed complement clauses, to be discussed in more detail in section 3.3.

(110) a.

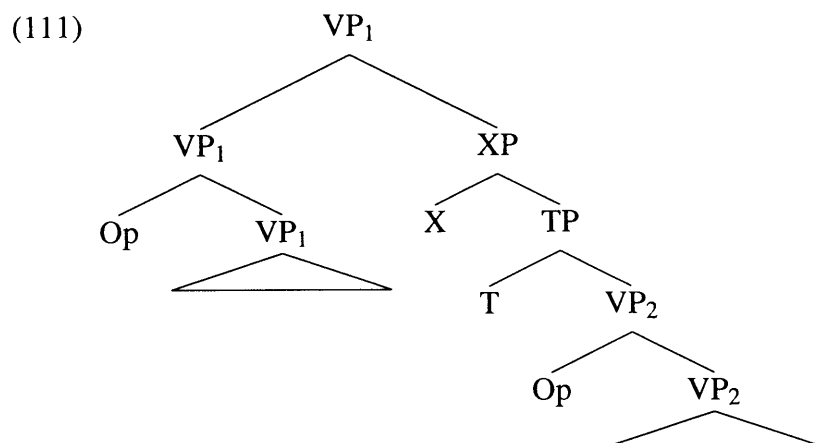


b.



The fact that some adjuncts are restricted to high positions in the clause is well established in the literature — see Cinque (1999) and Ernst (2002) for recent syntactic and semantic accounts, respectively. In such cases, the low attachment of the adjunct is independently ruled out, and so we are left with a choice between uninterpretability, as in (110a), and a multiple event reading, as in (110b).

The second subcase occurs when the verbal adjunct is finite, and so there is a T node within the adjunct itself. As above, this will necessitate the presence of an Op node above V but below T within the adjunct. This will, once again, bind the event variable in the adjunct's denotation, making it unavailable to form a single macroevent with the matrix VP's denotation. As before, the only interpretable structure will result in a multiple event reading, as in (111).



Moreover, in view of the introduction of Op, this is taken to be the null hypothesis in this regard. The complement of Op must denote a property of a single event, so if this complement happens to contain multiple VPs in, say, adjunction or coordination relations, then they had better also denote a property of a single event. In that case, syntactic limits on the size of event-denoting constituents can be derived largely from limits on the distribution of Op. Op is restricted to positions above the positions where internal arguments are merged, and below T, so any adjuncts merged above T can only give multiple event readings, whereas lower adjuncts will be ambiguous between single-event and multiple-event readings.⁴² Equally, there will only be such an ambiguity if the verbal adjunct is nonfinite. If the adjunct necessarily includes a T node, then it must also include an Op node, and so the event that it describes will not be able to form a macroevent with the event described by the matrix VP.

The theory sketched in this section, then, makes a number of predictions which will come in useful in chapter 3. Most salient of these, for now, is the prediction of syntactic height effects in the individuation of events, most notably that macroevent formation is impossible after T has been merged. However, the introduction of a second way of grouping events together, into entities of type $\langle \text{Ev}, t \rangle$ and $\langle \langle \text{Ev}, t \rangle, t \rangle$ rather than of type Ev, will also be returned to and explored further in chapter 3.

⁴²In principle, very low adjuncts, adjoined below an internal argument position, should only allow single event readings. I am unaware of many clear cases of such adjuncts where we would even want to consider multiple event readings, so I ignore this prediction here. However, it does appear to be at least a plausible claim with respect to resultative secondary predicates, which are merged very low and which are often taken as specifying an endpoint of an activity described by the verb, giving a single syntactically complex core event.

2.7 Summary

We have now reached the end of the exposition of the theory of events in this thesis, and we have arrived at a position which looks quite alien in comparison to many mainstream contemporary theories of events in linguistics. Key to this approach, however, are three quite innocuous notions.

- (112) a. Events come in different sizes, and one event is able to form part of another event;
- b. Contingent relations among events have a privileged status, and interact with agentivity;
- c. Events can form the basis for larger structure-building operations, such as set-formation.

This section will summarise the relations between these three areas, as seen through the lens of Fodor's generalisation (24), which hypothesises that there is a potential linguistic reflex of treating a portion of stuff that happens as a single event.

Firstly, we saw in section 2.2 that, although there is clear evidence to support (112a), there are also clear cases in which two events *cannot* jointly form a macroevent. We noted that the criterion which distinguishes the possible macroevents from the others was the nature of the relations holding between the two events. Accordingly, in section 2.4, we distinguished two related types of relations among events, namely *causation* and *enablement*, jointly known as the family of *contingent* relations. Two events may jointly form a macroevent only if they are related by a contingent relation. This is where (112b) comes in.

Although it was argued that causation and enablement form a natural class, we also saw that there are clear distinctions between the two. Specifically, enablement is modal and transitive, whereas causation, or at least *direct causation*, the linguistically relevant form of causation, is nonmodal and intransitive. Also, causation is purely a relation among events, whereas enablement relates an agent to a set of events. It was argued that these differences are in fact three sides of the same coin. *Agentivity* was defined as intentional goal-driven action by a rational actor, and it was this ability of agents to act in order to bring about a planned remote goal, by forward-chaining enablement relations in a manner similar to that described by Steedman (2002), that distinguishes causal relations from enablement relations. Just as the ability to plan by forward-chaining gives enablement the characteristic

transitivity missing from direct causation, so it also gives it its modal character and its agent-dependence. The events related by enablement are only planned events, and not necessarily actually occurring ones. On the other hand, the occurrence of a causing event leads, by definition, to the occurrence of a caused event.

We predict, therefore, that agentivity leads potentially to macroevents which are larger than those available in the absence of agentivity. This prediction was examined in section 2.5, and support was found for it from a variety of sources, from thought experiments involving a loss of free will on the way to buy some chips, through experimental evidence on the individuation of events in language and cognition from Wolff (2003), to a novel characterisation of the distinction between accomplishments and achievements with respect to the progressive.

We represented these structured relations among events in two stages. The first stage involved the definition of the *core event*, consisting of a maximum of two causally related components, the *process* (a temporally extended event treated linguistically as homogeneous), and the *culmination* (an event of a change of state treated linguistically as point-like). The core event gives us a way of characterising an analogue of the aspectual classes of Vendler (1957), although the details differ in some areas, it would appear correctly so. The restriction of core events to only two components gives us a way of capturing the directness of causal relations.

We then defined *extended events* as a series of core events, such that the first is an action performed by an agent with the intention that the last event should occur as a result, and with each event standing in a contingent relation to the previous one. In that way, we also find a way of representing the transitivity of enablement relations.

As well as providing a theory of event structure, this section has also aimed to show how this theory relates to other areas, such as syntax or pragmatics. Syntactically, apart from the height effects derived in section 2.6, there is in fact little to report. The major result was that we saw that there is no phrase-structural analogue of either of the contingent relations. In other words, phrase structural relations are underdetermined by event structural relations, in such a way that two events interpreted as standing in the same contingent relation can potentially occupy any one of many phrase-structural configurations. This divorce between the syntax and the semantics is at the heart of the novelty of the theory of locality to be presented in section 3.

On the other hand, we saw that there is a substantial role for pragmatics in this theory of event structure. The privileging of contingent relations (112b) implies the exclusion of other relations among events, notably temporal relations and conjunction. Often, we find a situation in which two events are related by one of these noncontingent relations in a way which is *compatible with*, but does not *determine*, an additional contingent relation. In these cases, the relation may be enriched to a stronger, contingent relation, subject to the conditions that (a) the contingent relation is compatible with the overtly expressed noncontingent relation, and (b) the contingent relation is compatible with real world knowledge about how events tend to relate to each other, and information supplied by the discourse context.

Moreover, section 2.6 showed us that the class of events delimited in this chapter was insufficiently broad to capture the full range of natural language data. Accordingly, the necessity of further structures, formed on the basis of this set of events was demonstrated. This possibility will be exploited in section 3.2.4.

In the remainder of this chapter, I wish to present a technical appendix comparing the specific event structure proposed here to a very close relative discussed in Moens and Steedman (1988). Their paper is the closest ancestor of the approach pursued here, and I feel it is necessary to justify the innovations I have made with respect to their theory. This appendix can safely be skipped without affecting the main line of argumentation of the thesis. Moving on from this, the following chapter aims to show a surprising application of this theory of event structure, in a domain which is usually considered to be at the heart of syntax, namely locality theory.

2.8 Appendix: Why Not Have More Parts to Core Events?

2.8.1 Introduction

By assuming that extended events consist of a series of related core events, I ignore a salient alternative possible analysis. On this analysis, rather than making a division between core events and extended events, we simply increase the number of subcomponents of the maximal core event template. On this approach, for example, we may add a third component, call it the *consequent state*, which would consist, in the case of an extended event, of a sort of “readiness” for the remote goal to occur. This would give a representation of subevent

- b. **Culmination:** The rock hits the water.
- c. **Consequent state:** The rock is in the lake.

For my approach, then, extended events consist of agent-dependent forward-chained core events, which in turn each consist of a maximum of two subevents. The most obvious division is into four classes of core events, three of which may form extended events in agentive contexts. For Moens and Steedman, on the other hand, all three subevents of their nucleus are on a par, and there is no more reason to draw a line separating culmination from consequent state, than preparatory process from culmination. Moreover, my proposal differs from Moens and Steedman's in that, by not having a 'consequent state' component, I reject the implicit claim that a result state entailed by a culmination forms a natural class with an enabled remote goal. For me, the former, being entailed by the culmination, belongs with the culmination, and is therefore part of the core event, whereas the latter is the domain of the extended event. This sits naturally with the discussion of the modal nature of enablement, in contrast to the nonmodal nature of causation, in section 2.4. For Moens and Steedman, though, the two both count as consequent states, and so the two notions are conflated. To decide between these two approaches, we need to look at the core of Moens and Steedman's paper, which is a treatment of *coercion* relations among aspectual classes, and particularly of the perfect. This will be done in the next subsection, after some further discussion of the representation of aspectual classes.

If we wished to reduce the naïve prediction of eight aspectual classes from (113) to a smaller number, the most natural thing to do would be to impose a restriction that only contiguous components of the nucleus can form an aspectual class. We thereby rule out one subset, namely the one consisting of process and consequent state, with no culmination. We might furthermore claim that states do not correspond to an absence of any subevents, but rather to a single consequent state component. If there is, in fact, no aspectual class corresponding to an empty subset of Moens and Steedman's nucleus structure, this would leave six predicted aspectual classes, as listed in (115).

- (115) a. Process + culmination + state = accomplishment
- b. Process + culmination = action
- c. Culmination + state = achievement

- d. Process = activity
- e. Culmination = point
- f. State = state

Plausible candidates for each of these classes can, in fact, be found. (115a 115c, 115d, 115f) are the familiar Vendlerian aspectual classes. We came across points as a new aspectual class in section 2.3 above. The class of *actions* (115b), however, is new.⁴³ An example of an action would be an event which has a clear preparatory process, and which comes to a definite end, but which does not have any necessary linguistically significant consequences. Examples would be VPs such as *punch a wall* or *run a lap*.⁴⁴

Note that actions are not cases that are missed by my classification. For me, they are a subclass of culminated processes. As my maximal core event does not have a consequent state component, the fact that nothing follows from actions is not sufficient to distinguish them from accomplishments or achievements as a separate class. For Moens and Steedman, on the other hand, accomplishments, achievements and actions are all different, giving a more fine-grained taxonomy. The crucial question, then, is whether this more fine-grained taxonomy has any advantages or drawbacks. I will approach this question by considering the nature of consequent states, which give rise to this prediction of a more fine-grained taxonomy, and discussing their role in Moens and Steedman's larger theory of coercion and of the perfect.

2.8.2 Coercion, the Perfect, and the Content of Consequent States

There is a twofold indeterminacy in our basic conception of the notion *consequent state*. We don't know *a priori* where the consequent state begins, and we don't know where (or if) it ends. As noted above, however, for Moens and Steedman, the consequent state covers broadly the same ground as my extended event formation, and necessarily either follows a culmination or occurs in isolation. In that case, it covers an in principle arbitrarily long

⁴³The terminology is my own, and should not be taken too seriously, as these terms have been used in different senses elsewhere in the literature. Similarly, the characterisation of achievements in (115c) goes against the discussion of the relationship between accomplishments, achievements, and agentivity in section 2.5. This is because I am trying to consider Moens and Steedman's proposal on its own terms, in which case a culmination + state core event is predicted, whatever we may call it.

⁴⁴Curiously, Moens and Steedman do not consider actions as a separate class, although their representation of nuclei would seem to predict their existence.

stretch of time (or series of events) starting immediately after the culmination is reached, and consisting of any event (not necessarily a state) contingently related to that culmination.

In this sense, there are two distinct components to a consequent state. On the one hand, we can take a traditional approach to the nucleus, seeing an analogue of the preparatory process in the antecedent event of Dowty's (1979) definition of the operator CAUSE, and seeing the culmination as an approximation of the interval at which Dowty's BECOME ϕ is true.⁴⁵

In that case, the core component of the consequent state would correspond to ϕ itself, the proposition which comes to hold as a result of the change of state embodied in any accomplishment or achievement. For the sake of clarity, let's call this a *result state*.

However, as noted above, Moens and Steedman (see also Steedman 2005) argue for a broader conception of the consequent state, which includes not just ϕ , but also events standing in an enablement relation to the event of ϕ 's coming to hold. Call this second part, consisting of a consequent state without the result state, the *possible consequences*. The possible consequences are distinct from the result state in that they are not entailed by the culmination, or related to it by direct causation, but are merely enabled by the culmination. As we have seen above, enablement relations are clearly weaker than relations of direct causation. For Moens and Steedman, then, possible consequences and result state form a unit, the *consequent state*, to the exclusion of the culmination. For me, on the other hand, the culmination proper and the result state form a unit (the *culmination*, in the sense in which the term has been used in the rest of this chapter) to the exclusion of the possible consequences, which are represented by extended events, where factors relating to agentivity make this appropriate.

⁴⁵The definitions of these operators in Dowty (1979) are as follows:

11. If $\phi \in ME_t$ then BECOME $\phi \in ME_t$, and $\llbracket \text{BECOME } \phi \rrbracket_{\mathcal{U},w,i,g} = 1$, iff (1) for some $j \in I$ containing the lower bound of i , $\llbracket \phi \rrbracket_{\mathcal{U},w,i,g} = 0$; (2) for some $k \in I$ containing the upper bound of i , $\llbracket \phi \rrbracket_{\mathcal{U},w,i,g} = 1$; and (3) there is no $i' \subset i$ such that (1) and (2) hold for i' as well as i .
15. If $\phi, \psi \in ME_t$ then $[\phi \text{ CAUSE } \psi] \in ME_t$, and $\llbracket [\phi \text{ CAUSE } \psi] \rrbracket_{\mathcal{U},w,i,g} = 1$ iff (1) there is some $i_1 \subseteq i$ such that $\llbracket \phi \rrbracket_{\mathcal{U},w,i_1,g} = 1$, (2) there is some $i_2 \subseteq i$ such that $\llbracket \psi \rrbracket_{\mathcal{U},w,i_2,g} = 1$, (3) there is no $i' \subset i$ meeting (1) and (2), and (4) there is a sequence of formulas $\chi_1, \chi_2, \dots, \chi_n$, where $\phi = \chi_1$ and $\psi = \chi_n$ such that $\llbracket [\neg \chi_k \rightarrow \neg \chi_{k+1}] \rrbracket_{\mathcal{U},w,j,g} = 1$, where $1 \leq k < n$ and $j \subseteq i$. (Dowty 1979:353)

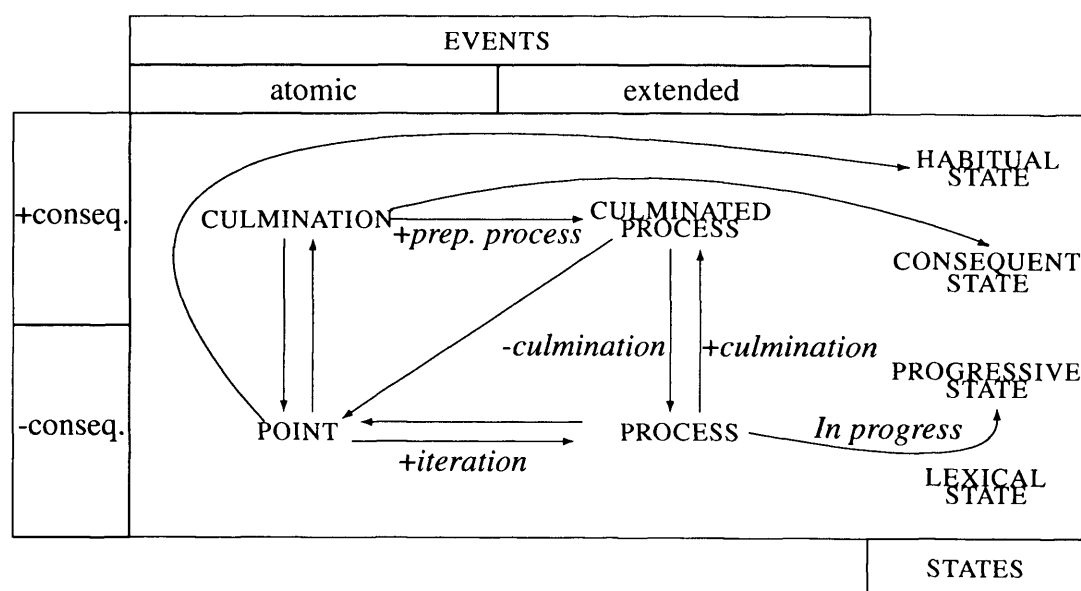
Roughly paraphrased, then, these say that BECOME ϕ is true for some proposition ϕ at an interval i iff i is the smallest interval such that ϕ is false at the start of i and true at the end of i , and $\phi \text{ CAUSE } \psi$ is true for propositions ϕ and ψ at an interval i if ϕ and ψ are both true at subintervals of i , and there is a counterfactual causal chain linking ϕ and ψ that holds at i .

We should check, then, that we do not lose empirical coverage with respect to Moens and Steedman's system by making this change. Happily, as will be shown below, it appears that we do not.

The Transition Network

Moens and Steedman's analysis is based around an operation called *coercion*, which transforms one aspectual class into another, either by adding or removing nucleus components, or by transforming the event into a state. They give a diagram of a complex network of such transitions, as in (116) (from Moens and Steedman 1988:18).

(116)



In this diagram, an initial cut is made between a class of events and a class of states, and two further binary parameters divide the class of events into four. Each arrow in the diagram represents a possible coercion transition, indicating that it is possible to take an example of the class corresponding to the label at the foot of the arrow and coerce it into a member of the class corresponding to the label at the point of the arrow. For example (Moens and Steedman 1988:17), *hiccup* is a typical point, but it can be used in the progressive, as in (117), with an interpretation either of iteration of the basic hiccuping event, or extreme slow motion.

(117) Harry was hiccupping.

Moens and Steedman model progressive forms as representative of the class of *progressive states*, and so one way to arrive at an interpretation of the progressive form *be hiccupping* is to follow the path through the transition network from the POINT node, through the PROCESS node, to the PROGRESSIVE STATE node.⁴⁶ This correctly predicts, firstly, that (117) is a legitimate sentence, and secondly, that it involves a somewhat nonstandard use of the predicate *hiccup*.

This diagram invites several comments. It is intriguingly close to a perfectly regular system, but, as it stands, deviates from regularity in puzzling ways. The regular system in question would be one where every transition consisted of either changing the value of one of the two binary features, or changing from an event to the associated class of states. The deviations from this regular system are, firstly, that the CULMINATED PROCESS→POINT transition involves changing the value of both binary features, rather than just one;⁴⁷ secondly, that there is no CULMINATED PROCESS→CULMINATION transition; and thirdly, that there is no class of STATE associated with CULMINATED PROCESSES.

There are also deviations in another sense, namely that there is no place in the diagram for the class of ACTIONS delimited in (115b). This is a puzzling omission, as ACTIONS would stand in the same relation to POINTS as CULMINATED PROCESSES do to CULMINATIONS.

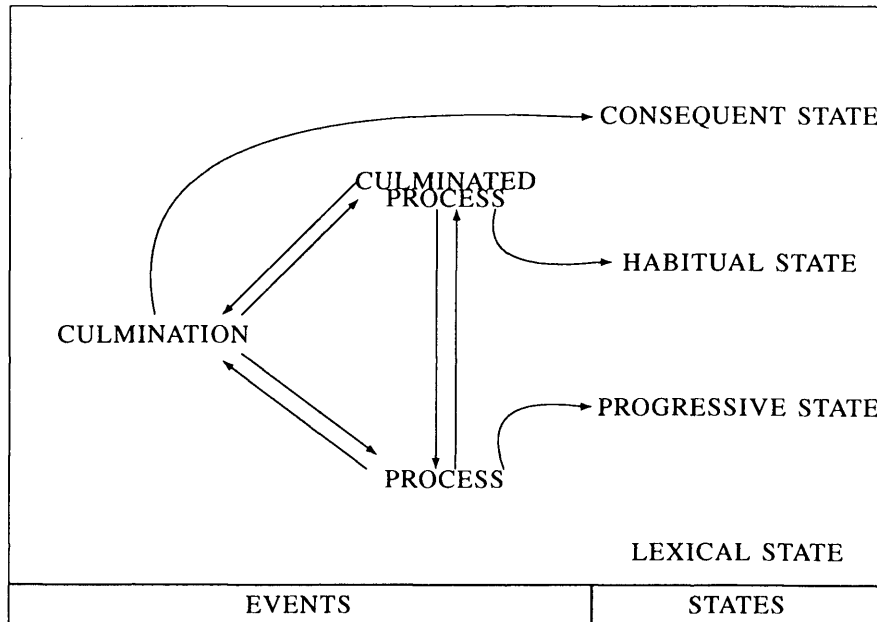
Looking at it another way, there is an apparent redundancy in the inclusion of both POINT and CULMINATION as nodes. Firstly, note that only one node can make the transition to the CULMINATION node. This is the POINT node. Secondly, CULMINATION itself can only make the transition to two other nodes, namely back to POINT or onwards to CULMINATED PROCESS, which is itself assumed to be coercible to a POINT. Thus far, then, the coercion functions mapping POINT to CULMINATION and CULMINATION to CULMINATED PROCESS could be composed, giving a single POINT→CULMINATED PROCESS transition, and a completely regular system with three eventive nodes, PROCESS, CULMINATED PROCESS, and POINT / CULMINATION, each of which can be coerced directly into each of the other two, or into a given type of state. This system would look broadly like this, leaving aside matters of which binary features (if any) distinguish the eventive classes, and making

⁴⁶Another way would be to follow the path from POINT, via CULMINATION, CULMINATED PROCESS and PROCESS, to PROGRESSIVE STATE. This presumably corresponds to the slow-motion interpretation of (117), while the straightforward route corresponds to the iterated interpretation.

⁴⁷I will adopt the convention in this section of using small capitals exclusively to refer to the nodes in Moens and Steedman's transition network, and the subsequent proposed modifications to it, for clarity.

slightly arbitrary choices as to which eventive class maps to which type of state.

(118)



This transition network differs from (116) primarily in that the CULMINATION and POINT nodes have been collapsed into a single node, in view of their apparent redundancy in (116). However, making this change has knock-on effects associated with it. Firstly, we can no longer associate the three remaining eventive nodes with two binary features in any obvious way, and so the precise nature of the distinctions between the three eventive classes is lost. Secondly, we have to modify the transitions from events to states. In (116), POINTS are associated with HABITUAL STATES, whereas there is no transition directly from CULMINATED PROCESSES into any class of states. In (118), we have lost the POINT node, and so the obvious repair to make is to associate HABITUAL STATES with CULMINATED PROCESSES, giving a symmetry to the system: each of the three eventive nodes is associated with a transition to a separate class of derived states.

However, this solution will not work. Habitual states cannot only be formed from culminated processes. In an example like (119), the interpretation is habitual, but there is no sense of culmination or of the existence of a linguistically relevant consequent state associated with the wandering process.

(119) John wanders around quite often.

Similar examples can be constructed with habituais constructed from actions (*John punches walls*), achievements (*John falls into rivers*), and points (*John hiccups*) as well as culminated processes. In none of these cases is there any clear sense in which the subevent structure must be coerced to that of a CULMINATED PROCESS (or indeed any other specific aspectual class) prior to the transition to the HABITUAL STATE. It seems, then, that a simple-minded attempt to fully regularise Moens and Steedman's transition network will not work.

Moreover, there are supplementary worries about the transition network, which become apparent upon closer consideration of the question of what, if anything, makes it legitimate to consider the types of state listed in (116) as a unified class. In fact, as we will see in the next subsection, it seems that there is little reason to consider them as such.

What Makes a State a State?

In addition to the LEXICAL STATES, which I take to be the prototypical examples of states, there are three classes of derived state in (116) to be considered, namely the HABITUAL, CONSEQUENT, and PROGRESSIVE STATES. Of these, the PROGRESSIVE STATE is clearly different from prototypical, lexical states, in that it is a spatiotemporally located eventuality. This can be clearly seen by contrasting the acceptability of *wh*-questions concerning the spatiotemporal locations of the two classes. They are perfectly acceptable with progressive, but not with lexical, forms

(120) a. Where is John working?

b. When will John be working next?

(121) a. # Where does John know French?

b. # When will John next know French?

Furthermore, the CONSEQUENT STATE is quite markedly different from lexical states, in that it can include other events as subparts, while I am unaware of any lexical states that do so. This is a matter of definition for Moens and Steedman, but is also, I believe, crucial to their analysis of the perfect. A perfect does not merely assert that the result state, as defined above, has been attained, but rather asserts that any relevant potential consequences

of the event may now follow. This is why, as Moens and Steedman point out, an example like (122) is odd, but rescuable in context.

(122) #Harry has hiccupped. (Moens and Steedman 1988:16)

This sounds ungrammatical unless some greater consequence than usual hangs on Harry's hiccupping. (122) would, for example, be fully acceptable if uttered by a commentator at an athletics meeting where Harry's hiccups were used rather than a starter's pistol to signal the beginning of a race. In that context, the import of (122) is that the athletes should start running, which seems quite the opposite of a canonical state.

Of the three non-lexical classes of state in (116), it appears, then, that only the HABITUAL STATES are true states. For example, they pattern with lexical states in allowing *for how long* questions and simple present verb forms, as shown in (123).⁴⁸

(123) a. For how long has John been building houses?

b. John builds houses.

This gives the lie to the apparent near-regularity of this part of the transition network represented in (116), suggesting that this is less of an obstacle than it might seem to the modifications suggested above. I now turn to a related question of whether perfects should always be derived from CULMINATIONS. Again, it seems that the answer is negative.

Possible Consequences and The Perfect

As a first piece of evidence in that perfects are not always associated with CULMINATIONS, note that, in order for one to make the transition, necessary in (122), from the POINT of *hiccup* to the CONSEQUENT STATE of *has hiccupped*, one needs to pass through the intermediate CULMINATION node. CULMINATIONS, it will be recalled, are distinguished from POINTS in Moens and Steedman's system in that they include a linguistically salient change of state. However, it seems implausible to claim that *has hiccupped* entails a change of state

⁴⁸Things are slightly less clear than this, in that habitual interpretations are not incompatible with the progressive, contrary to what we may expect if they are stative, and the progressive is a Vendlerian test for an activity, an accomplishment, or (as I have argued in section 2.5) an achievement. An example such as *John is making mistakes at the moment* arguably has a habitual feel to it. Regardless, I think it is fair to say that the habitual is more state-like than the other possibilities suggested by Moens and Steedman.

to any greater extent than *hiccup*. All that changes is that we focus more on the possible consequences of the event in question.

Secondly, there are cases in which a consequent state clearly exists, but the perfect is nonetheless odd. One such case is in (124).

(124) #I have eaten a peanut.

This is clearly a CULMINATED PROCESS — there is a process component (chewing the peanut), a culmination (swallowing the chewed peanut), and a consequent state (the ex-peanut reaching a state of eatenness). However, (124) is noticeably odd under a regular context. To interpret (124), we need to add some further, more impressive consequences of the peanut-eating event. For example, (124) would be quite acceptable if uttered in a state of panic by someone with a severe peanut allergy. The consequences of eating a peanut, in that case, are that immediate treatment is required before the eater goes into anaphylactic shock. Less urgently, if I asked my friend (who has a very small appetite) whether she is hungry, she may reply by saying (124), and I would go through the usual pragmatic reasoning to arrive at the conclusion that my friend's eating of a peanut has satisfied her hunger, and so she is not hungry.

What is clear, however, is that the result state *entailed* by the eating of a peanut, namely that the peanut stops existing as a unit and becomes an eaten ex-peanut, is not enough to warrant use of the perfect. In that case, only a subclass of CONSEQUENT STATES, the *possible consequences* in the terminology introduced above, are able to license use of a perfect.

Secondly, note that, in some cases, perfects can be associated with non-culminated processes or states. This phenomenon is illustrated in (125a) for processes and (125b) for states.

(125) a. I have worked all my life.

b. I have been happy all my life.

There is no sense from these examples that the speaker has finished working or being happy, and so no obvious reason to claim that they involve a culmination.⁴⁹ If so, it seems

⁴⁹It could be claimed that it is equally hard to find a sense in which the examples in (125) have anything

like the perfect can be derived from at least POINTS, PROCESSES, CULMINATED PROCESSES and STATES, as well as CULMINATIONS. The conclusion from the three arguments taken together must be that coercion to the CULMINATION node is neither a necessary nor a sufficient condition for use of the perfect.

It is, however, necessary that an event have *possible consequences* if it is to allow the perfect. This was seen clearly with respect to (124). This example necessarily included a result state, but one which didn't usually lead to any salient possible consequences. Only if we managed to do a bit of creative thinking to find such possible consequences could (124) be acceptable. However, possible consequences do not form a unit to the exclusion of result states in Moens and Steedman's theory. In my theory, on the other hand, they are clearly associated with the notion of extended events.⁵⁰ I take this to be an empirical advantage of my approach over that of Moens and Steedman. As for the apparent advantage of their theory, in that it provides a fine-grained model of the formation of different classes of derived states, this falls prey to the criticism that many of these apparent classes of states do not behave like states according to standard Vendlerian distributional criteria. I have accordingly made what I believe is the minimal modification possible to their system, preserving their insights while avoiding their pitfalls. Further ramifications such as the association of extended event formation with agentivity (section 2.5) then fall out naturally.

So what would a transition network like (116) look like in my system? Representing such a network on paper is hard, as the possibility of extended event formation essentially adds a third dimension, in addition to the presence or absence of process and culmination components. However, (126) is the best approximation I can manage.

to do with possible consequences. The strength of this objection depends on whether or not an argument can be made that an example like (i), which involves possible consequences and expectations, is somehow more basic than (ii), which does not.

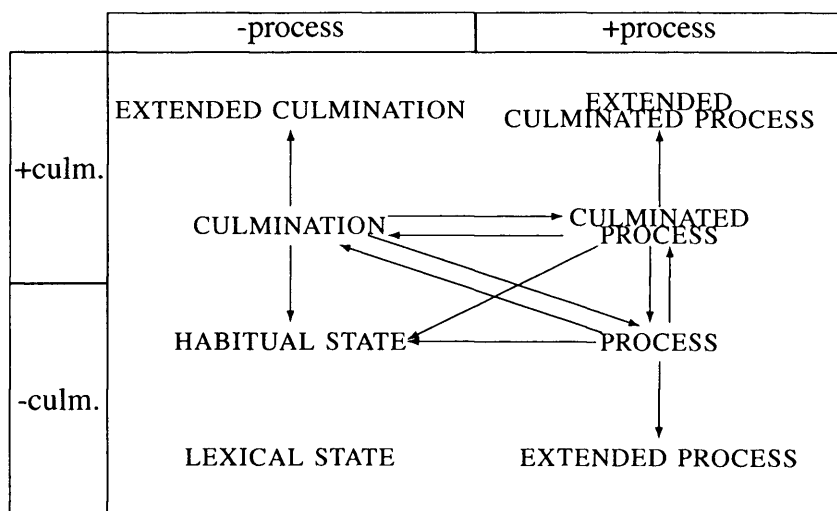
(i) I have worked all my life, and now I can afford holidays in the sun.

(ii) I have worked all my life, and I'm still working now.

At present, I know of no such argument, so I leave the matter for the future.

⁵⁰There is a technical difference between this use of extended events and that discussed in section 2.5, in that here, it is not necessary for the *subject* of the sentence to be agentive. The enablement relations are "seen" instead by the speaker, the other rational being necessarily present in a typical speech situation. Although this option is more widely available, I abstract away from it as far as possible for the sake of simplicity.

(126)



(126) consists of four components. Firstly, there is a central triangle formed from the CULMINATION, CULMINATED PROCESS and PROCESS nodes, each of which can be directly coerced to either of the other two. Next, there is a transition from each of these three nodes to a corresponding class of extended events. Thirdly, there is a transition from each of the three original nodes to the class of HABITUAL STATES, the sole remaining class of derived states if the above discussion is on the right track. Finally, and quite independently of the rest of the system, there is the class of LEXICAL STATES, which cannot be related to any of the other nodes by transitions.⁵¹

(126) works on the assumption that the four classes of core events are derived from the presence and absence of the two components of the maximal core event, namely the process and the culmination. However, for clarity, the distinction between lexical states and habitual states is retained from Moens and Steedman. Moreover, each of the core eventive classes is associated with an extended eventive class. States are not associated with an extended class, on the assumption that extended events need agentivity, and states are nonagentive.

Comparing (126) to (116) or even (118), some detail appears to have been lost. However, this is a result of my claim that progressive “states” are actually processes, and consequent “states” are actually extended events. These classes are therefore covered by the relevant transitions in (126). The only remaining type of derived state is therefore the habitual state. Although I do not believe that transition networks are the most perspicuous way of representing the theory I have presented in the rest of this chapter, then, it seems that

⁵¹Exactly how the transition relating stative *annoying* to activity *be annoying*, as discussed in section 2.5, fits into this network is an open question.

we can at least form a network which is compatible with the theory developed in this thesis and has some empirical advantages over that of Moens and Steedman (1988) with respect to the representation of the perfect and the progressive. With this digression over, I move on to the following chapter, which demonstrates that the theory of event structure defended here has a substantial role to play in describing patterns of *wh*-movement.

Chapter 3

Events and Locality

3.1 Introduction

3.1.1 Predictions

We began the previous chapter with the guiding hypothesis (18), repeated below.

(18) Events form locality domains for *wh*-movement.

Wh-questions carry a presupposition that the minimal constituent containing the head and the foot of the chain describes a single event. *Wh*-movement is permitted only if the denotation of that minimal constituent can be construed accordingly.

When we first encountered this condition, the question of the individuation of events had only pre-theoretical content. Now, we have a fully-fledged theory of event structure, and accordingly, we can make a more explicit set of predictions concerning the acceptability of different cases of *wh*-movement.

The overall architecture of the theory being presented here is one where the syntax overgenerates *wh*-constructions, but is reined in by the semantic and pragmatic components, which act essentially as a filter, checking whether it is possible, and whether it is feasible, to accommodate the presupposition carried by use of a *wh*-question. Ill-formed *wh*-questions are then, in some cases, semantically or pragmatically unacceptable rather than syntactically deviant.¹

¹This is not to claim that there are no locality conditions on *wh*-movement other than (18). That condition is apparently incapable of distinguishing between subjects and objects, for example, as both have the same argumental status. Subject islands are beyond the scope of (18), then, for example, as is the left branch condition (as there is presumably no notion of leftness in semantics), and many others, to be discussed in section 3.4.5.

This leads to a prediction of a different “shape” to patterns of acceptability of *wh*-movement than that which would be expected under a purely syntactic account. According to most current syntactic theories, the grammaticality or otherwise of a sentence is a discrete fact. For example, the Minimalist architecture described most fully in Chomsky (1995) allows for only two outcomes of a syntactic derivation: either it crashes, or it converges. If the acceptability of *wh*-question formation were a purely syntactic matter, then, we would expect grammaticality judgements to be quite categorical in these matters. On the other hand, an account such as the one proposed here, in which the pragmatics plays a significant role, suggests a more gradient pattern of acceptability judgements. This is because pragmatic operations such as accommodation are not necessarily as automatic as syntactic structure-building operations such as Merge and Move, and people’s judgements of the acceptability of a given sentence may reflect factors such as the amount of cognitive effort required to accommodate the relevant presupposition and coerce the described events into one of the types of relation detailed in chapter 2 and further elaborated below. On the account proposed here, then, we may expect to see quite gradient patterns of acceptability judgements, subject to both inter- and intra-speaker variation, and reflecting the perceived functional and associative relations between the specific subevents described in particular examples.

More specifically, in a construction containing an untensed verbal adjunct, the operator Op described in section 2.6 can attach quite freely to each verbal constituent individually, or it can attach once in a position where it has scope over both event variables. This generates multiple-event and single-event readings, respectively, and these two options will always be produced by the syntax in examples containing nonfinite adverbials, whether the sentence in question is declarative or interrogative. The role of the presupposition carried by *wh*-questions is to filter out the multiple-event readings in the interrogative cases, leaving only the single-event readings. Whether a given single-event reading is felicitous or not depends on an interlocutor’s willingness to admit that any subevents of that single event are appropriately related, which depends in turn on real-world knowledge and the creative ability to perceive novel links between subevents.

There is nothing *syntactically* ill-formed about the relevant class of cases of deviant extraction from an adjunct, then. In terms purely of narrow syntax, the derivation converges. However, Chomsky discusses a third option besides regular convergence and crash-

ing, namely convergence as gibberish. This occurs when a syntactically well-formed structure is uninterpretable at or beyond the interfaces. The implication of the theory being developed here is that many deviant cases of *wh*-movement owe their ill-formedness not to a syntactic crash, but to convergence as gibberish. Borrowing some familiar examples from Chomsky's earliest syntactic writings, a common assumption has been that the ill-formedness of a case such as *What does John work whistling?* ((4c) in the introduction) is parallel to that of the flatly ungrammatical *Furiously sleep ideas green colourless*, while this thesis proposes that its deviance is closer (although clearly not identical) to that of the nonsensical *Colourless green ideas sleep furiously*.

Moreover, as we will see, there are many limiting cases where accommodation of the presupposition is either automatic (for example because the subevents are explicitly stated to stand in a contingent relation), or completely impossible (for example because other structural factors such as tense prohibit the formation of a single-event reading). In such cases, the gradience of the phenomenon is masked, and replaced by a discrete type of (in)felicity, akin to the discrete judgements of (un)grammaticality we expect in response to narrow syntactic structures. This means that this theory gives us an explanation for the fact that some extractions from adjuncts, for example, "feel" either categorically ungrammatical or fully acceptable, while others elicit more gradient responses, despite the absence of any obvious syntactic distinctions which might motivate such a pattern.

Based on the findings of the previous chapter, we can make several specific predictions about how these patterns will manifest themselves. In general, every time we have no reason to prohibit relating two events in such a way as to form a single macroevent, we predict *wh*-movement out of the constituents describing those subevents to be acceptable. However, we have also developed a good many reasons why macroevent formation may be blocked. The three key reasons are the following:

- (127) a. Inappropriate construal of relations among subevents;
- b. Factors pertaining to real-world knowledge;
- c. Syntactic height effects relating to Op.

In the rest of this section, I will spell out exactly what we may expect to find in these respects.

Turning first to the construal of relations among subevents, we see that this is guided by two main factors:

- (128) a. The space of possibilities permitted by the general theory of event structure;
b. The specific restrictions imposed by the element introducing the adjunct (if any).

(128a) refers to the fact that the admissible ways of relating two subevents as part of a single macroevent are, in and of themselves, quite restricted. We argued in chapter 2 for an event structure constructed in three stages. Firstly, we build *core events* according to a very restrictive template (section 2.3). Core events consist of a maximum of two subevents, a *process* and a *culmination*, such that the process directly causes the culmination. Any more than two subevents, and any relation other than direct causation, are inadmissible within a core event. However, core events may be forward-chained to form *extended events*, the recursive step in event-formation (section 2.5). There is no upper bound to the number of subevents of an extended event, but extended event formation is constrained firstly by the requirement that subevents are connected by relations of causation or enablement. Moreover, extended events correspond to the plan that an agent has when performing the initial subevent within that extended event. Finally, we saw in section 2.6 that there is a need to consider still larger event structures consisting of groupings of events, a possibility that will be developed further in section 3.2.4.

Event formation privileges a class of *contingent* relations, then, consisting minimally (and, I suspect, maximally) of causation and enablement. These two relations are linked to temporal structure, in that if e_1 causes or enables e_2 , then it also precedes e_2 temporally, although two events can of course be ordered with respect to time while remaining completely independent in terms of causation or enablement. This is, primarily, where (128b) comes in. Although the introducing element of certain classes of adjunct, for example *in order* clauses and possibly *by*-phrases, directly specifies a contingent relationship between the events described by the matrix VP and the adjunct, more often (particularly with prepositions such as *before* and *after*), a temporal relation, or some other non-contingent relation, is specified. In either of these cases, however, the possibilities for combining the matrix and the adjunct events into a glorious whole are restricted. If the adjunct in question is an *in order* clause, for example, then the adjunct event must be construed as the goal at the end of an extended event, with the matrix event as the initial subevent thereof. If, on the other

hand, the adjunct is an *after* phrase, then we know that the matrix event follows the adjunct event in terms of temporal order. This is only compatible with macroevent formation if the adjunct event causes or enables the matrix event, rather than *vice versa*, as the opposite order would violate the mapping between temporal and contingent relations discussed in section 2.4.

Beyond these formal constraints, there are, of course, pragmatic and interpretive factors to consider, as mentioned in (127b). It is not automatically the case that we are willing or able to take two subevents which are not explicitly specified to stand in a contingent relation, and arrive at an enriched interpretation where the two events are contingently related. Matters of real world knowledge of which events usually cause or enable which other events, and of which events meet the necessary conditions to be able to cause which other events (even if such a relation would be quite unusual) may make such an enrichment procedure either close to automatic, or near-impossible, depending on the descriptive content attached to particular event variables. This is a further way in which an attempted construal where the necessary contingent relations hold among subevents can be infelicitous.

As mentioned in (127c), we predict that, in addition to semantic and pragmatic effects relating to event structure, the possibility of extraction will also be constrained by height effects. Building on the theory developed in section 2.6, extraction is not possible from an adjunct containing an occurrence of Op, and extraction is not possible from a verbal adjunct adjoined above an occurrence of Op in the matrix clause.² This means, in more concrete terms, that extraction from only VP-adjuncts is predicted (any higher and Op would already have been merged in the matrix clause), and extraction from only untensed adjuncts is permitted (or perhaps, as will be suggested in section 3.3.1, even adjuncts without modals, auxiliaries, etc. — any more structure within the adjunct may, once again, require Op, on the theory of section 2.6).

The purpose of this chapter is to test this intricate network of predictions. The primary testing ground will be extraction from three classes of verbal adjunct, to be introduced in section 3.1.2. In that section, I will also present a basic syntax and semantics for adjuncts, consisting essentially of the bare minimum needed to get the discussion of locality off the ground. After that, in section 3.2, we will see that hypothesis (18) makes largely accurate

²See section 3.3 for a way of resolving the obvious clash between this claim and examples of successive-cyclic movement out of a finite embedded clause, which clearly involves movement past an occurrence of Op, if we follow the line proposed in section 2.6.

predictions with respect to these three classes, although a substantial addition to the theory of chapter 2 will be presented in section 3.2.4 to account for some surprising interpretive asymmetries in the case of extraction from bare present participial adjuncts.

It goes without saying, though, that these three classes of adjunct are not privileged with respect to (18). Ultimately, that hypothesis will stand or fall according to its ability to predict acceptability of extractions more generally. Of course, anything like a comprehensive coverage of the interaction of (18) with all the conceivable cases of extraction in natural language is far beyond the scope of this thesis. However, section 3.3 shows how (18) handles the *sine qua non* of any theory of A'-dependencies, namely their apparently unbounded character, and the interaction of (18) with a successive-cyclic theory of movement. This is placed in the context of a discussion of the interaction of presupposition, factivity, and event structure, working within the approach to presupposition pioneered by van der Sandt (1992). One welcome side-effect of this approach is a novel, nonsyntactic, explanation of the factive island phenomena investigated by Erteschik-Shir (1973).

By that point, we have a robust theory of the impact of event structure on locality considerations. The final substantive section explores the extent to which this event structure is genuinely independent of phrase structure, an important issue in the light of the reductionist theories of Lakoff (1970), Hale and Keyser (1993) and Ramchand (2006), among others. Several reasons will be given for keeping a substantial part of the event structure of chapter 2 strictly separate from phrase structure. However, this section will also consider the division of labour between syntax, semantics and pragmatics with respect to A' locality more widely. Although this thesis aims to reduce the prominence of syntax in locality theories, it is clear that there remains a substantial amount of work for pure syntax in locality theory. Section 3.4 will also, therefore, discuss the wider architectural implications of the implementation of (18) presented here.

3.1.2 Adjuncts in Syntax and Semantics

Before moving on to the empirical meat of this chapter, we need to go through a few preliminaries in this subsection. Firstly, I will introduce a few basic assumptions about the syntax and semantics of verbal adjuncts, and secondly, I will describe the three classes of adjunct which will be used below as a testing ground for the theory of extraction developed in the thesis.

Turning first to the syntax and semantics of adjuncts, there is one clear property which will do substantial work in deriving the distributions of acceptable extractions from different classes of adjuncts. This is their semantic status as functors, a property which may initially seem to clash with their syntactic status.

From a purely syntactic point of view, adjuncts do not project. In other words, a VP, for example, remains a VP even after an adjunct is added to it, according to any distributional test. An adjunct, then, has at least one important syntactic characteristic: its mother is never its projection.³

Semantically, on the other hand, it appears that the head of the adjunct is a functor. To see this, consider the range of *prepositional participial adjuncts*, consisting of a participial verb phrase embedded within a prepositional layer, as in (129).

(129) a. John came home [after [speaking to Mary]].

b. John came home [before [speaking to Mary]].

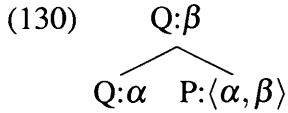
Assuming, for the sake of simplicity, that such adjuncts adjoin to VP, and that the participial phrases contained within the adjuncts are also VPs (nothing substantial would change if either of the assumptions were inaccurate), we can state that in both of these examples, both *come home* and *speaking to Mary* describe properties of events (more accurately, a function from individuals to properties of events, but I will abstract away from the role of the subject here). It is clear, then, that the function of the preposition, *after* or *before*, is to specify the relation between these two events.

This is a very similar semantic role to that played by V in a regular transitive clause. If we say *John kissed Mary* or *John hit Mary*, it is the verb, *kiss* or *hit*, that specifies the relation between *John* and *Mary*, just as it is the preposition, *after* or *before*, that specifies the relation between *come home* and *speak to Mary* in (129). In the same way that a verb taking two individual-denoting arguments is considered to be a functor of type $\langle e, \langle e, t \rangle \rangle$, then, it is natural, if *come home* and *speak to Mary* are of type α , to take the preposition to

³This is half of the definition of *adjunct* proposed by Johnson (2002), who adds that an adjunct is a phrase whose sister is also a phrase. I do not follow Johnson directly for two reasons. Firstly, that definition would also include subjects, for example, as adjuncts, while the subject subextraction facts are quite independent of the adjunct subextraction facts, as we will see in section 3.4.5. Secondly, it may be objected that certain adjuncts either are not phrasal (monomorphemic adverbials, for example) or do not have phrasal sisters (e.g. resultatives on a complex predicate analysis).

be a functor of type $\langle\alpha, \langle\alpha, t\rangle\rangle$.⁴

Adjuncts, then, represent one case in which the usual syntactic identity of functors as projecting elements breaks down. This is not the only such case — an analysis of quantified noun phrases as nonprojecting $\langle\langle e, t \rangle, t\rangle$ functors taking $\langle e, t \rangle$ arguments is formally similar in this respect. Moreover, van Riemsdijk (1998) makes a convincing case that many functional heads and semilexical nouns fall into this category, and Neeleman et al. (2004) show that the same holds for a particular class of degree expressions. This is not the place to go into the architectural implications of this fact, but see van Riemsdijk, Neeleman et al., and Truswell (2006), for discussion.⁵ For our purposes, I will simply assume that, despite the nonprojection of verbal adjuncts, the functor determining the relation between the event-denoting constituents in the matrix VP and the verbal adjunct is, in fact, the head of that adjunct, a preposition or a phrase such as *in order*, which I will refer to below as an *introducing element*. Schematically, then, the syntax and semantics of an adjunct line up as in (130): an adjunct P of type $\langle\alpha, \beta\rangle$ takes its sister Q, of type α , as a semantic argument, but it is nonetheless Q that projects syntactically.⁶



In turn, this captures naturally the fact that different introducing elements constrain the semantic relations holding among matrix and adjunct events in different ways. Such constraints can refer to contingent relations, or to non-contingent relations, such as temporal order or overlap. These constraints will be seen to interact with the event structure developed in chapter 2 in many subtle ways. The rest of this chapter will sketch the nature of such interactions, and their consequences for patterns of *wh*-movement, for three classes of verbal adjunct, distinguished by their introducing elements.

The three classes in question are: (i) ***In order clauses***, definable as subject-controlled infinitival adjuncts expressing a goal, generally introduced by the phrase *in order to*, but

⁴To be sure, alternatives to this position are conceivable, in the same way that Montague's program of generalising to the worst case led to a theory where nouns were actually functors taking verbs as arguments. Following Partee (1987), though, it has become standard to assume that, although more complex types are necessary in certain cases, they can be derived from last-resort type-shifting operations rather than being postulated as basic. In that case, the intuition that the verb is the functor in the basic case can be maintained, and the parallel argument that the preposition is the functor in (129) will also survive intact.

⁵To some extent, the notion of *relativized head* in Williams (1994) is also relevant here.

⁶Of course, in most cases, an adjunct will be an identity-typed functor, of type $\langle\alpha, \alpha\rangle$, in which case the mismatch between syntax and semantics will be less evident.

sometimes simply by *to*, as illustrated in (131a);⁷ (ii) **prepositional participial adjuncts**, consisting of a present participial verb phrase introduced by a preposition, as in (131b); and finally, (iii) **bare present participial adjuncts**, similar to the prepositional participial adjuncts, but lacking any overt introducing element,⁸ as in (131c).

- (131) a. i. John is talking to Mary [in order to anger Bill].
 ii. John came back [to discuss our problems].
 b. i. John went home [before talking to Mary].
 ii. John went home [after talking to Mary].
 iii. John went home [without talking to Mary].
 iv. John fell asleep [while talking to Mary].
 v. John angered Bill [by talking to Mary].
 c. i. John drove Bill crazy [talking to Mary].
 ii. John arrived [whistling a hornpipe].

Although these are a disparate selection of adjuncts, they do share certain characteristics. Trivially, they are all verbal, as opposed to other familiar classes of adjunct such as PPs, attributive adjectives, or nominal parentheticals, but there are many less basic commonalities. Most importantly for our purposes, and in view of the predictions made in

⁷See Jones 1991 for diagnostics distinguishing this class from the superficially similar, but thematically distinct, classes of subject-gap and object-gap purpose clauses, illustrated in (i–ii) respectively.

(i) John brought Bill_i in [*e*_i to work on this car].

(ii) John_i brought these tyres_j in [*e*_i to put *e*_j on this car].

As (iii–iv) show, extraction from both of these classes of purpose construction is also possible, but I will largely ignore them in this thesis in order to concentrate on the basic *in order* case.

(iii) ?Which car_i did John bring Bill_j in [*e*_j to work on *t*_i]?

(iv) ?Which car_i did John_j bring the tyres_k [*e*_j to put *e*_k on *t*_i]? (Jones 1991:74)

⁸We may wish to claim there is a null preposition introducing bare present participial adjuncts to maximise the similarity of this class to the prepositional participial adjuncts, and heighten the transparency of the syntax–semantics mapping. This would also go some way toward explaining the fact that examples such as (131c) are most naturally translated into French, for example, with the adjunct introduced by a preposition such as *en* ‘in’ or *par* ‘by’. However, we will see in section 3.2 that the behaviour of the two classes with respect to event structure is somewhat different. I therefore continue to treat the two classes separately here.

section 3.1.1, they are all untensed, in contrast to the close counterparts of some of the examples in (131) listed in (132).

- (132) a. John went home [before he talked to Mary].
b. John went home [after he talked to Mary].
c. John fell asleep [while he was talking to Mary].
d. John is talking to Mary [so that Bill will get angry].

On the other hand, there are interesting differences between the three adjunct types. The class of *in order* clauses have an introducing element which explicitly specifies that a contingent relation holds between the matrix and adjunct events, or more precisely, that the matrix and adjunct events specify the initial and final subevents in an extended event, respectively. Prepositional participial adjuncts also have a relation among events explicitly specified by their introducing element, but for the most part, these relations are temporal, or related to some other noncontingent order. In contrast, bare present participial adjuncts have no overt introducing element. I claim that, in such a case, the only necessary link between the matrix and adjunct events corresponds to a maximally simple relation consisting, essentially, of conjunction, plus minimal restrictions on temporal proximity to be made more precise in section 3.2.4 below.

With these classes introduced, I turn to their interrelationship with *wh*-movement. As ever, it is not just the distribution of *wh*-movement out of these classes in and of itself which is interesting, so much as the discrepancies between this distribution in declaratives and interrogatives. Such a comparison is undertaken in the first three subsections of the next section.

3.2 Extraction from Adjuncts

3.2.1 Introduction

In chapter 1, I introduced four puzzles that point to an elaborately patterned set of data concerning extraction from adjuncts. Firstly, the *restricted extraction puzzle* showed us that extraction of referential DP complements is quite free from within one class of adjuncts,

namely *in order* clauses (2), while it is constrained in the case of bare present participial adjuncts by factors pertaining to lexical aspect (3–4).

- (2) a. What did you come round [in order to work on t]?
- b. Which paper did John travel halfway round the world [in order to submit t]?
- c. What did Christ die [in order to save us from t]?

- (3) a. **Adjunct describes an accomplishment:** ✗ What did John drive Mary crazy [building t]?
- b. **Adjunct describes an activity:** What did John drive Mary crazy [whistling t]?

- (4) a. **Matrix VP describes an accomplishment:** What did John drive Mary crazy [whistling t]?
- b. **Matrix VP describes an achievement:** What did John arrive [whistling t]?
- c. **Matrix VP describes an activity:** *What does John work [whistling t]?
- d. **Matrix VP describes a state:** *Which magic hat does John know Georgian [wearing t]?

In fact, this puzzle can be broken down into two halves. On the one hand, the surprising interaction of extraction from bare present participial adjuncts with lexical aspect demands an explanation. But on the other hand, the fact that it is specifically *in order* clauses that allow unrestricted extraction of DP complements is equally surprising, and initially no less puzzling.

The second puzzle, the *restricted answers puzzle*, concerns the fact that the wellformedness of a certain question appears to be influenced by the content of the answer which it receives. This was illustrated by the paradigm in (5–6).

- (5) A: Which book did John design his garden [after reading t]?
B: An introduction to landscape gardening.
- (6) A: Which book did John design his garden [after reading t]?
B: # *Finnegans Wake*.

Thirdly, the *interpretive puzzle* concerned the differences in the perceived relations among events in the cases of extraction out of bare present participial adjuncts modifying accomplishments, on the one hand, and achievements, on the other. Here, too, the puzzle comes in two parts. Firstly, in each case, the interpretations allowed in the interrogative case are a proper subset of those allowed in the declarative case, as is shown by comparing the examples in (12) for the accomplishment case, and (13) for the achievement case, to the grammatical extractions in (4a–4b) above. Secondly, though, the interpretive difference between (4a) and (4b) shows that the permitted interpretations in each of these cases are different depending on the aspectual class of the matrix VP.

(12) a. John painted this picture eating apples.

b. * What did John paint this picture [eating *t*]?

(13) a. John came home dripping mud all over the living room carpet.

b. ??/* What did John come home [dripping mud on *t*]?

Finally, the *unlikely antilocality puzzle* highlighted an apparent discrepancy between the adjunct extraction data and the usual pattern of syntactic locality theory. Syntactic locality effects usually show that if we compare two dependencies, one of which traverses a proper subset of the syntactic material traversed by the other, then the shorter dependency will be at least as acceptable as the longer one. This is in contrast to the adjunct extraction data, though, where we find contrasts such as the following.

(14) a. ?? What did John drive Mary crazy [fixing *t*]?

b. What did John drive Mary crazy [trying [to fix *t*]]?

Here, the shorter dependency is clearly degraded with respect to the longer dependency, offering a clear challenge to an account of patterns of extraction from adjuncts within regular syntactic locality theory.

The aim of this section is to derive, and expand upon, these data. Before doing so, however, I want to take a moment to see what current syntactic theories of locality have to say about such patterns.

In fact, no current purely syntactic theory of locality gets close to describing the set of data given here.⁹ Syntactic locality theories can be broadly divided into four classes, the status of one of which is less clear from a minimalist perspective. Firstly, post-CED theories (Uriagereka 1999, Johnson 2002)¹⁰ work on the assumption that movement is absolutely impossible from certain domains. Secondly, minimality-type theories (Rizzi 1990, Chomsky 1995, Starke 2001) claim that a given movement step is illicit if it crosses a closer element of ‘the same type’. On the minimalist reinterpretation of this approach, this reduces to the claim that a feature on a probe can only enter into an agreement relation with that feature on a goal if there is no closer element bearing the same feature. Thirdly, phase-based theories (Chomsky 2000, 2004, Fox and Pesetsky 2005) claim that movement out of certain domains is impossible unless the moved element is close enough to the edge of that domain. Finally, the older, and currently somewhat disfavoured, barriers-type theories (Chomsky 1986, Cinque 1990) suggest that a movement step crossing a given node is illicit unless that node enters into certain relations (e.g. proper government) with other nodes.¹¹

It should be clear that a post-CED theory is no use to us here. All of the references cited above make extraction from an adjunct impossible, in which case the existence of examples such as those given throughout this section is seriously problematic.

An alternative post-CED theory would be one in which the criteria for domains allowing extraction are modified in such a way that extraction from an adjunct is uniformly possible. However, in that case, the ungrammaticality of examples such as those in (133) goes unexplained.

⁹This is not to claim that the gradience of extraction out of adjuncts is not well-known, but simply that it has long been seen as a thorn in the side of locality theories. Chomsky (1982), for example, lists examples such as the following, commenting that they ‘range in acceptability from fairly high... to virtual gibberish’ (Chomsky 1982:72). No satisfying account of this gradience is forthcoming there, however.

- (i) Here is the influential professor that John went to college in order to impress *e*.
- (ii) The article that I went to England without reading *e*.
- (iii) The book that I went to college because I liked *e*.
- (iv) The man that I went to England without speaking to *e*. (Chomsky 1982:72)

¹⁰I do not include the original CED as formulated in Huang (1982) within this list, as that theory differs from its minimalist reworkings in relativising extraction domains to the distribution of a syntactic relation, namely proper government, rather than to purely phrase-structural domains. Arguing that the a theory in the mould of the original CED would be unable to account for the patterns to be discussed here is a trickier task, and I postpone it until section 3.4, when the full range of data will have been introduced.

¹¹Of course, the boundaries between these modes of explanation are not sharp, and many hybrid theories exist. This is a good first approximation to the state of the art, though.

- (133) a. *What did you come here [because Mary wanted to talk to you about *t*]?
b. *What did John go home [after Mary said *t*]?
c. *What was little Jimmy playing in the sandpit [screaming about *t*]?

More problematically still, such a theory will struggle to account the distinction between (4a) and (4c), as we will see shortly that there is little clear evidence for a phrase-structural distinction between these two examples to go along with the distinction in grammaticality.

What a post-CED theory lacks is a way of stating that extraction from a given domain is sometimes permitted and sometimes impossible, but that seems to be the best description of the facts here. A post-CED theory will not give us a handle on such facts, then.

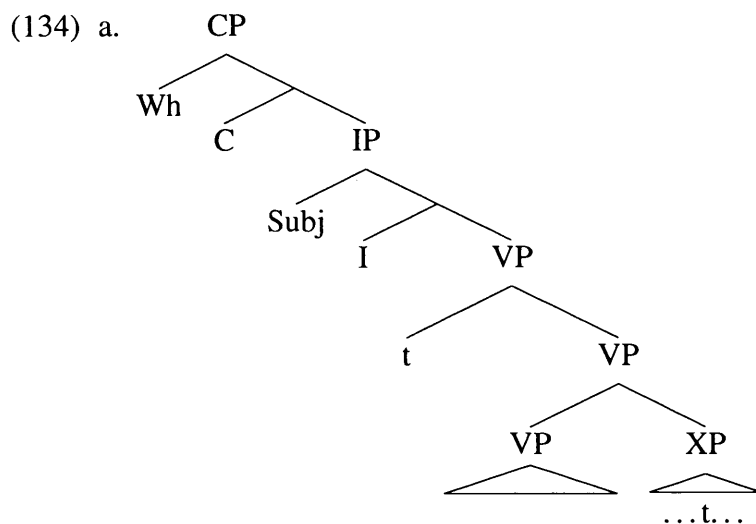
The minimality-type, phase-based, and barriers-type approaches *can*, at least in principle, capture the fact that extraction from an adjunct, the domain in question, is only sometimes legitimate. On a minimality approach, the natural way to capture such a pattern is to associate an *A'* feature of the relevant type with the head of all and only adjuncts which do not allow extraction. This would ensure that a probe looking for a goal would not be able to see past the head of such adjuncts and establish an agree relation with any more deeply embedded subconstituent. Meanwhile, for a phase-based approach, we could perhaps assume that adjuncts are always phases, but that only certain adjuncts have an available edge position, and so only those adjuncts will allow subextraction. And on a barriers-type approach, the opportunities are legion.¹² For example, it is possible to stipulate that some, but not all, adjunct maximal projections can be adjoined to. As adjunction to a barrier allows a phrase to “slip past” that barrier in Chomsky’s (1986) theory, and as adjuncts, as unselected constituents, will always constitute barriers, we may in principle relate the patterns of extractability from adjuncts to the patterns of availability of adjunction to adjunct maximal projections.

However, the minimality-type, phase-based, and barriers-type approaches suffer from a quite complementary problem. This is that all three of these approaches relate locality effects to properties of the nodes crossed by a given movement step. However, the paradigm in (4), as repeated above, shows that contrasts in grammaticality of extraction from adjuncts cannot always be reduced to properties of the nodes on the path from base position to surface position. In those cases, the syntactic structure of the adjunct and the matrix clause

¹²See Jones (1987) for a critical survey.

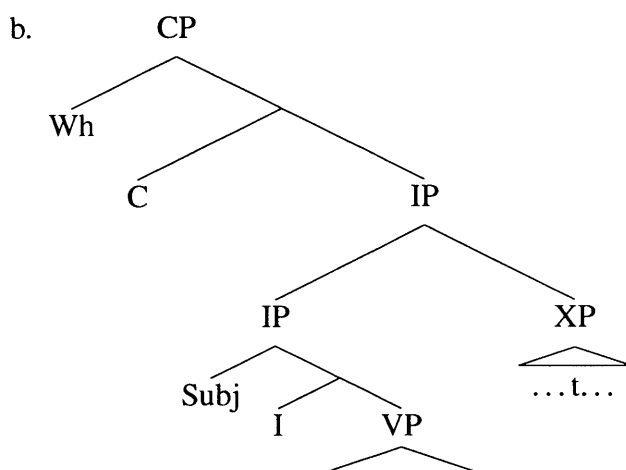
above VP level is identical across examples. The only syntactic differences are located in the lower VP, to which the adjunct is attached. These three types of locality theories have no way of holding this lower VP responsible for the differences in acceptability of the different extractions.¹³

One further tool that could in theory be employed to distinguish between the grammatical and ungrammatical cases of extraction from adjuncts is syntactic height. Many classic theories of locality have predicted a correlation between attachment height and extractability. Most pertinently for our purposes, the barriers theory as presented in Chomsky (1986) predicts a distinction between VP-adjuncts and IP-adjuncts, as VP is a potential adjunction site for an A'-moved constituent but IP is not. In that case, a chain like that in (134a), involving extraction from an adjunct attached to VP, is legitimate (or at the worst, only violates 0-subjacency), while a similar chain involving extraction from an adjunct attached to IP, as in (134b) is illegitimate as the trace and its antecedent are not 1-subjacent.¹⁴



¹³We may wonder whether an analysis along the lines of the original CED could account for a paradigm as in (4). In principle, such an analysis is better equipped to deal with apparent locality effects due to properties of the adjunct's sister, as it may be possible to claim that some extra relation holds between an adjunct and (nodes within) its sister in a case like (4a), in addition to any such relations that hold in (4c), for example. I will return to the problems with this approach in section 3.4, but I suspect that, fully developed, it would amount to little more than a syntacticisation of the semantic story developed here.

¹⁴It should be pointed out that Chomsky does not make use of this theoretical possibility, although his theory would have given him the power to do so if he so desired. It is explored to some extent in many late-GB texts, though, for example in Haegeman (1994:568).



However, it seems clear that not all variation in extractability from adjuncts can be reduced to variation in height of attachment. To take just one minimal pair, and one constituency test, we see that a bare present participial adjunct modifying an accomplishment-denoting VP can be optionally stranded by *do so*-ellipsis, as can such an adjunct modifying an activity-denoting VP. It looks, then, like the adjuncts attach at the same height in the two cases. However, as (4) showed, only the former allows extraction. In that case, the movement asymmetry we find here cannot be reduced to a height effect.

(135) a. John [drove Mary crazy whistling], and Bill did so too.

b. John [drove Mary crazy] whistling, and Bill did so running round in circles.

(136) a. John [works whistling polkas], and Bill does so too.

b. John [works] whistling polkas, and Bill does so singing madrigals.

More generally, any syntactic approach will have to go through quite some contortions in order to explain two facts about the data concerning extraction from adjuncts. The first one, referred to above as the restricted answers puzzle, concerns the effect that an answer's semantic content may have on the acceptability of a given case of extraction. The second, much more basic, fact is that the acceptability of such extractions from adjuncts is quite gradient and, at times, unstable. As mentioned in section 3.1.1, this is in contrast with the basic nature of our grammatical theory, which works very much in black and white. Chomsky (1995), for example, only gives two possible outcomes of a syntactic derivation. It crashes, or it converges. The range of responses we find to the sentences at issue here

covers both of these extremes, but also many points in between. Our syntactic theory is simply not set up to make such fine distinctions.

Even disregarding the fact that any syntactic approach to such locality facts seems to be inevitably founded on pure stipulation, then, we see that these approaches suffer from apparently intractable problems. Although the problems faced by the different types of approach are not identical, the basic problem is that the degradation of many cases of extraction from adjuncts cannot be pinned down to any independently motivated lexical item, constituent, structural configuration, or syntactic relation. This means that a syntactocentric approach to these data is left without any solid foundation.

This is quite in contrast to the approach pursued in this dissertation, which is distinguished by the fact that it takes events and relations among them as elementary building blocks, rather than constituents and the relations among them. We will see in the coming subsections that, time after time, the event-structural approach makes light work of empirical material which is simply beyond the explanatory scope of any purely phrase-structural locality theory.

3.2.2 *In Order* Clauses

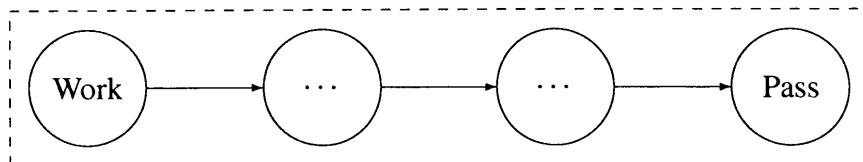
In a way, the pattern of extraction from *in order* clauses is very simple, in that extraction of the relevant class of DP complements is always possible. Taking a broader perspective on this matter, however, a less trivial question emerges. This is the question of *why* it should be specifically this class of adjuncts which allows extraction so readily, as opposed to, say, *after*-phrases or bare present participial adjuncts. Of course, it is relatively straightforward to stipulate a syntactic story which facilitates extraction from this particular class of adjuncts in some way, but, as the comments in the previous subsection suggest, attempting to elevate such a theory from the level of descriptive adequacy to explanatory adequacy seems quite unpromising. The same is not true on the event-based theory proposed here, as will become clear below.

As noted in section 3.1.2, *in order* clauses are distinguished from the other types of adjunct under consideration in this thesis by an introducing element which specifies that a contingent relation, namely goal-driven enablement, holds between the two events described in the matrix and adjunct VPs. So, in an example like (137a), it is automatically

possible to construe these two events as a single event, as schematised in (137b).¹⁵

(137) a. John is working hard in order to pass his exam.

b.



This is the reason why extraction from specifically *in order* clauses is so free, on the account proposed here. The introducing element, *in order*, specifies that a relation of the right type holds between the adjuncts described in the matrix VP and the adjunct, and the prediction made by (18) is consequently clear: all else being equal, extraction from an untensed *in order* clause should also be automatically possible.

This is indeed what we find. As soon as we control for the distribution of *in order* clauses in declaratives, the relevant cases of extraction from *in order* clauses are apparently always well-formed.

The distribution of *in order* clauses in declaratives is constrained by one major factor, namely the requirement that the event be under the subject's control, a result of the fact that they necessitate extended event formation. This makes a rough initial cut between cases with matrix accomplishments and activities, on the one hand, and the other aspectual classes on the other: as accomplishments and activities readily allow agentive subjects, they should also readily allow adjunction of an *in order* clause, unlike the other classes. As points and states, as well as many culminated processes traditionally considered to be achievements, are often nonagentive, however, *in order* clauses are frequently infelicitous with these classes. This is illustrated in (138).

(138) a. **Matrix VP describes accomplishment:** John travelled to England to make a sculpture of the Queen.

b. **Matrix VP describes activity:** John is jumping up and down in order to attract Mary's attention.

¹⁵This and subsequent similar diagrams should be interpreted as follows. Each circle corresponds to a core event, and an arrow between two circles represents a contingent relation holding between two events. Finally, a sequence of circles enclosed within a dashed box corresponds to an agent's plan.

- c. **Matrix VP describes achievement:** ?? John arrived at base camp in order to reach the summit in a few days.
- d. **Matrix VP describes point:** # John noticed the typo in order to annoy the copy-editor.
- e. **Matrix VP describes state:** # John knew the answer in order to frustrate the other pub quiz teams.

However, as expected, there are cases where canonical achievements and points do allow adjunction of an *in order* clause, with an agentive interpretation of the subject, as in (139a–b) and (139c), respectively.¹⁶

- (139) a. Christ died in order to redeem our sins.
- b. I came in today to talk to you about fly fishing.
- c. I tapped my nose in order to signal the presence of an intruder to Mary.

This shows that the baseline for extraction from *in order* clauses is one in which many possibilities are already ruled out for reasons independent of locality of movement. Once such factors are controlled for, however, it appears that extraction of complements from *in order* clauses is generally free. Certainly, movement out of any of the foregoing grammatical examples is quite possible, as shown by (140).

- (140) a. What are you working so hard [in order to achieve *t*]?
 b. Who did John travel to England [to make a sculpture of *t*]?
 c. Whose attention is John jumping up and down [in order to attract *t*]?
 d. What did Christ die [in order to save us from *t*]?
 e. What did you tap your nose [in order to signal *t* to Mary]?
 f. What did you come in [to talk to us about *t*] today?

¹⁶See the discussion of (67) on the impossibility of *in order* clauses modifying stative verbs.

It seems reasonable to claim, then, that extraction of complements from *in order* clauses is essentially unrestricted, once we control for factors restricting the distribution of *in order* clauses in declaratives in the first place. This is exactly as predicted by (18), which means that we can begin to explain the fact that specifically this type of adjunct allows subextraction so freely, as opposed to simply describing it.

3.2.3 Prepositional Participial Adjuncts

The *in order* clauses discussed in the previous subsection represent the simplest and clearest case where (18) predicts extraction out of an adjunct to be possible. The element introducing the adjunct specifies that the events described in the matrix and the adjunct VPs are contingently related, meaning that macroevent formation, and consequently extraction, should always be possible. And the prediction is borne out. However, as was noted in the introduction to this section, things are not always so clear-cut. In many cases, the patterns of extraction from adjuncts are either much more complex, or much more variable in terms of acceptability. In itself, this latter fact presents a problem for a purely syntactic approach to extraction patterns, as there is currently no clear place for such variability in minimalist grammar. Hopefully, it will become clear that the event-based approach is much more readily equipped to deal with these phenomena.

In this subsection, I present a more complex pattern of data, where (18) correctly predicts that we will find less categorical grammaticality judgements. This concerns the family of *prepositional participial adjuncts*. Although these form a natural class based on their internal syntactic structure, the specified relation among events is here dependent on the semantics of the preposition introducing the adjunct, and so we may expect to find extraction patterns from these adjuncts varying according to the choice of that preposition. Moreover, there is a possible effect of syntactic height to consider, as there is no guarantee that prepositional participial adjuncts all attach at the same height, and it has been claimed (e.g. by Cinque 2003) that regular PPs are not freely ordered within the clause.

I will not attempt a systematic discussion of extraction from every class of prepositional participial phrase in English here, but rather choose cases which are hopefully illustrative of the range of possibilities we predict on the approach developed above. So I will present data concerning one preposition (*by*) which appears, at least at first sight, to specify a contingent relation; two prepositions (*before* and *after*) which specify noncontingent relations, but

which may receive enriched, contingent interpretations congruent with the requirement (42) that a causing (or enabling) event must temporally precede the caused (or enabled) event; and two prepositions (*since* and *upon*) which resist any extraction out of their complement.

Before we proceed, it must be noted that the grammaticality judgements presented here are the most marginal of any discussed in this thesis. Many native speakers of English, perhaps even a majority, are very reluctant to accept cases of extraction from many of the above classes. Accordingly, the judgements given below will often be marked to reflect to contrast between acceptability for some speakers (%) and general rejection (*). However, it is still legitimate to report these findings, given the existence of speakers (including myself) whose idiolects allow extractions in the pattern reported here. Moreover, it will become apparent as we proceed that this is in fact the area where the greatest amount of speaker variation in acceptance is predicted by the present approach.

Patterns of Extraction from *By-participial Adjuncts*

On the assumption that a *by*-phrase asserts that the matrix and adjunct events in question are contingently related, such that the adjunct event causes or enables the matrix event, *by*-phrases are predicted to allow subextraction quite freely. In fact, that proves to be the case. Certainly, plenty of grammatical cases of extraction out of such adjuncts can be found. (141) gives a selection.

- (141) a. % Which speech did John make his point [by reciting *t*]?
 b. % Which item of furniture did John upset his hosts [by eating *t*]?
 c. % Which path did John reach the summit [by walking along *t*]?

However, extraction from *by*-phrases is not universally possible. Two major sources of ungrammaticality can be isolated, both again concerning the distribution of *by*-phrases in declaratives, which is strictly independent from (18) and so does not invalidate the approach adopted here. In the first case, we find an apparent restriction on the combination of aspectual classes in declarative examples containing *by*-phrases. The pattern is quite an unusual one, and I won't go into the possible reasons for its existence, but I have been unable to find grammatical cases of *by*-phrases in the following aspectual configurations.

- (142) a. *Matrix VP describes an accomplishment, adjunct describes an achievement*: * John drove Mary crazy by reaching the summit.
- b. *Matrix VP describes an accomplishment, adjunct describes a point*: ✗ John drove Mary crazy by noticing the problem.
- c. *Matrix VP describes a point, adjunct describes an accomplishment*: * John noticed the problem by building a prototype.
- d. *Matrix VP describes a point, adjunct describes an achievement*: * John noticed his brother by turning up.
- e. *Matrix VP describes a point, adjunct describes a point*: * John noticed his brother by turning the telescope on.
- f. *Matrix VP describes an activity, adjunct describes an accomplishment*: ?? John works on the project by building a prototype.
- g. *Matrix VP describes an activity, adjunct describes an achievement*: ?? John works on the project by turning up.
- h. *Matrix VP describes an activity, adjunct describes a point*: ?? John works on the project by noticing a problem.

It is unsurprising, then, that extraction out of adjuncts in such aspectual configurations should also be severely degraded. The following are a representative sample.

- (143) a. ?? What did John drive Mary crazy [by noticing *t*]?
 b. * Which model did John work on the project [by building *t*]?
 c. * Which problem does John work on the project [by noticing *t*]?

The second major source of ungrammaticality for *by*-phrases apparently is related to competition with the class of bare present participial adjuncts, to be discussed below. We will see in section 3.2.4 that bare present participial adjuncts are interpreted in many cases as describing causes of the event described in the matrix VP. Such cases clearly have a significant overlap with the interpretation of *by*-phrases, and in many cases, only one of the two options feels natural. This is illustrated below.

(144) a. John opened the door *(by) pressing this button.

b. John turned the house upside down (*by) looking for his glasses.

Although the formal details escape me, it seems reasonable to claim that this pattern is related to some further specification of the semantics of *by* beyond a purely contingent relation. Specifically, it appears that a *by*-phrase, above and beyond the causal relation that it specifies between the two subevents, also involves a “means” component. So, for example, in (144a), an acceptable interpretation is that the means by which John opened the door was pressing the button. However, in (144b), it is absurd to talk of the means by which John turned the house upside down. Regardless of whether this suggestion generalises to the full range of environments in which *by* occurs, though, it is no surprise to find that whichever factors are behind the pattern in (144) also rule out extraction from the *by*-phrase in such cases. This is shown in (145)

(145) a. % Which button did John open the door [*(by) pressing *t*]?

b. What did John turn the house upside down [(*)by looking for *t*]?

In sum, then, although the factors governing the distribution of *by*-phrases in declaratives may be somewhat puzzling, extraction from *by*-phrases does appear to be generally possible once such factors are controlled for. This provides a good baseline for further exploration of extraction out of prepositional participial adjuncts, where we will find more restrictive patterns.

Patterns of Extraction from *Before*- and *After*-participial Adjuncts

The primary semantic function of *before* and *after* is, of course, to relate the matrix and adjunct events temporally. As we have seen in section 2.2, purely temporal relations fall outside the class of contingent relations. Two events standing in a relation of temporal contiguity therefore do not automatically qualify as a single macroevent, and as a result, extraction from a *before*- or *after*-phrase is not predicted to be automatically possible according to (18). However, as we saw in section 2.4, this primary specification of a temporal relation between two events can be enriched in such a way that it comes to be interpreted as a contingent relation, subject to real-world knowledge. In this way, the interpretation

of the relation between two phrases linked by *before* or *after* depends very much on our interpretation of those two phrases. As we saw in section 2.4, real-world knowledge makes it much less plausible to infer a causal relation in (43b) than in (43a), where the inference that the two events are causally related is quite natural. However, given the right context, we saw that even (43b) could be coerced into a causal interpretation.

- (43) a. John collapsed after colliding with a lamp post.
 b. John collapsed after reading *The Master and Margarita*.

This shows that availability of a contingent interpretation of *before* or *after* is very much a gradient phenomenon, based on an individual's willingness to admit an interpretation of two events as causally related. In a case such as (43a), construal of the two events as contingently related is almost automatic, while in a case such as (45), repeated below, a causal interpretation of the relation between events is all but impossible, as the temporal order specified by *before* is incompatible with the would-be enriched causal order.

- (45) We had a weird night out last night. After a few beers, we fell through a wormhole into a parallel universe where the flow of causation was reversed so that a cause happens after its effects. It was terrible. John collapsed before colliding with a lamp post. So don't expect too much from him today.

As extraction from a verbal adjunct requires the presence of just such a relation, however, we predict that this gradience will carry over directly to the grammaticality judgements for extraction from *before*- and *after*-phrases. We will see below that this is just what we find.

There is, however, a further complicating factor. We have seen that we predict the acceptability of extraction from this class of adjuncts to be dependent on the possibility of construing the matrix and adjunct events as contingently related. However, extraction from an adjunct crucially removes part of the description of the adjunct event. Consider the question in (146).

- (146) % Which book did John design his garden [after reading *t*]?

Is it plausible to consider the book-reading and garden-designing events as contingently related? That depends on the choice of book. Certain books (*Finnegans Wake*, for example)

have nothing whatsoever to do with garden design, while other books (such as *The Essential Garden Design Workbook* by Rosemary Alexander) have as their *raison d'être* the enablement of garden designing. Whether the presupposition of a single event introduced by the *wh*-movement in (146) is satisfied or not depends, in that case, on the choice of *answer* to the question. In this way, the presupposition which the question carries, as a result of the *wh*-movement, comes to give the appearance of being a presupposition concerning the answer. This can be seen by the following judgements: although some speakers never fully accept questions such as (146), there is general agreement that a choice of answer as in (147a) ameliorates the dialogue in comparison to (147b), and, for some speakers, makes it fully acceptable. (148) gives a parallel set of examples with *before* instead of *after*.

- (147) a. A: % Which book did John design his garden [after reading *t*]?
 B: *The Essential Garden Design Workbook* by Rosemary Alexander.
- b. A: % Which book did John design his garden [after reading *t*]?
 B: # *Finnegans Wake*.
- (148) a. A: % Which professor was John working so hard [before meeting *t*]?
 B: The one who decides whether he gets the job or not.
- b. A: % Which professor was John working so hard [before meeting *t*]?
 B: # The one who lives next door who he plays golf with.

In contexts where such readings as (147a) or (148a) are preferred, extraction from *before*- and *after*-phrases is quite possible for many speakers.¹⁷ A selection of further examples is given in (149).

¹⁷Although we expect a degree of speaker variation in this area, we may wonder why the level of variation is so high, and indeed why some speakers consistently reject examples such as (147b). We can imagine many hypotheses in this respect. For example, it may be that the extra pragmatic step of enrichment required to bring an example like (147b) into line with condition (18) is sufficient to push such examples over an “ungrammaticality threshold” for many speakers. In other words, speakers may vary in the amount of effort they are willing to expend to arrive at a grammatical reading for an example. Such hypotheses readily suggest themselves, and are indeed testable (for instance, we might expect that if the people who judge these examples to be ungrammatical have a lower “ungrammaticality threshold” than those who judge them to be acceptable, then people may be quicker to judge such sentences as ungrammatical than they are to judge them grammatical). Unfortunately, though, testing them is beyond the scope of this dissertation.

- (149) a. % Which professor did John rewrite his paper [after meeting t]? [Acceptable if the meeting was related to the paper, unacceptable if purely temporal].
- b. % Which project did John die [before finishing t]?¹⁸
- c. % Which picture is John doing lots of research [before looking at t]? [Acceptable if the research is connected to the painting, but not otherwise].

Further support can be given to the claim that the answer to such questions must be compatible with a contingent interpretation, by considering ways in which speaker B may expand upon his answer. (150) shows that, unsurprisingly, a case such as (147a) is unaffected by a further statement asserting that reading Rosemary Alexander's book enabled the designing of the garden. Strikingly, however, (151) shows that even the answer *Finnegans Wake* can be rescued if speaker B asserts that, implausibly, that book proved to be useful in matters of garden design.

- (150) A: % Which book did John design his garden [after reading t]?

B: *The Essential Garden Design Workbook* by Rosemary Alexander. It really helped.

- (151) a. A: % Which book did John design his garden [after reading t]?

B: Actually, it was *Finnegans Wake*. It really inspired him, believe it or not.

- b. A: % Which book did John design his garden [after reading t]?

B: #*Finnegans Wake*. It had nothing to do with designing the garden, though. Things just turned out that way.

In actual fact, it is not straightforward to test the parallel negative prediction, namely that extraction from the adjunct should be ungrammatical in cases where the descriptions of the relevant events make enrichment to a contingent relation implausible. Quite simply, this is because the possibility of construal of two events as contingently related is dependent on the creativity of an individual, and finding examples which absolutely preclude this possibility

¹⁸This does not fit in strictly with the characterisation of event structure given above. Instead, the death interrupts a chain of contingently related events which would have led to completion of the project. I am certain that minimally expanding the definition of *macroevent* to cover such cases is possible, but I do not have a concrete suggestion for how to go about it at present.

is high on impossible. However, examples such as the following, chosen so as to make a contingent construal particularly unlikely, are generally rejected (although even here, if we imagine a context in which a glass-breaking ritual bestows good luck on the recipient of the letter, these examples don't sound so bad, to my ears at least). This, together with the contrasts noted in (147–148) and (150–151), supports the general approach developed here.

- (152) a. (*) Which letter did John break a glass [after writing *t*]?
 b. (*) Which letter did John break a glass [before writing *t*]?

In sum, extraction from participial adjuncts introduced by *before* and *after* shows all the characteristics predicted on the current approach. Extraction is dependent on an enriched interpretation of these temporal prepositions, where the matrix and adjunct events are contingently related. Acceptability of extraction from such adjuncts is therefore gradient rather than categorical, and is dependent on an individual's willingness and ability to see a contingent relation between the two events in question. Moreover, the plausibility of such a relation is dependent not just on the form of the question itself, but also on the expected *answer* to the question, which plays a vital part in determining whether the presupposition of a contingent relation among events is met.

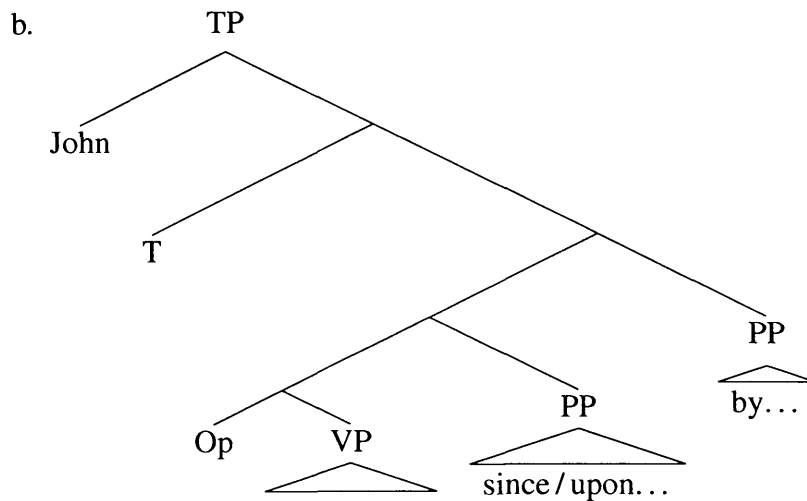
Patterns of Extraction from *Since*- and *Upon*-participial Adjuncts

The pattern of extraction from this third class of prepositional participial adjuncts is a simple one: extraction is impossible, and no amount of manipulation of the inferred relation among events can help us here. An illustrative selection of examples is in (153–154).

- (153) a. John has been grinning manically since meeting the evangelist.
 b. * Who has John been grinning manically [since meeting *t*]?
 (154) a. John rushed over upon hearing the good news.
 b. * What did John rush over [upon hearing *t*]?

Of course, on the standard theory of locality, where extraction from adjuncts is excluded, this is exactly what we expect to find. In the current circumstances, however, the

- (157) a.
-
- ```
graph TD
 TP --> John
 TP --> T
 TP --> VP1[]
 VP1 --> Op
 VP1 --> VP2[]
 VP2 --> VP3[]
 VP2 --> PP1[]
 VP3 --> VP4[]
 VP4 --> VP5[]
 VP5 --> VP6[]
 PP1 --> PP2[]
 PP2 --> PP3[]
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 PP260 --> PP261[]
 PP26
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This makes one prediction which appears to be borne out. If the word order difference in (156–157) is indeed due to the availability of two attachment sites for *by*, we predict extraction to be impossible from the higher attachment site, above *Op*, illustrated in (155a) and (156b). This correctly derives the contrast between (158a), in which the *by*-phrase is in the lower position, and (158b), in which it is in the higher position, and likewise for the *upon* case in (159).

- (158) a. % What has John been irritating his colleagues [by talking about *t*] [since meeting the clairvoyant]?
- b. \* What has John been irritating his colleagues [since meeting the clairvoyant] [by talking about *t*]?
- (159) a. % Which country did John hide himself away [by travelling to *t*] [upon receiving the warning]?
- b. ?? Which country did John hide himself away [upon receiving the warning] [by travelling to *t*]?

However, there are too many poorly understood and apparently conflicting factors influencing the possibility of extraction from multiple PPs to have much faith in these data alone. In fact, though, there is further slight evidence supporting the claim that *since*- and *upon*-phrases attach outside *Op*, from their interaction with perfectivity. According to the account developed in section 2.6, single-event and multiple-event readings of a given constituent arise from a structural ambiguity in the attachment site(s) of *Op*, which merges

freely, constrained only by a requirement that it be merged once on the path from a verbal head to the first c-commanding Aux or T head. Now, both *since* and *upon* interact to a significant extent with perfectivity, associated with outer aspect and so with the auxiliary system. As shown in (160–161), *since*-phrases require that the phrase to which they attach be perfective, while *upon* phrases require the opposite.<sup>19</sup>

(160) a. John has been grinning manically since meeting the evangelist.

b. \*John grinned manically since meeting the evangelist.

(161) a. \*John has been grinning manically upon meeting the evangelist.

b. John grinned manically upon meeting the evangelist.

This sensitivity to perfectivity is not found with any of the other classes of prepositional participial adjunct discussed above.

(162) a. John has come to stay before flying home tomorrow.

b. John came to stay before flying home the following day.

(163) a. John has recovered fully after visiting the doctor.

b. John recovered fully after visiting the doctor.

(164) a. John alienated all his friends by stealing their belongings.

b. John has alienated all his friends by stealing their belongings.

Although it is far from conclusive, the contrast between (160–161) and (162–164) may suggest that *since*- and *upon*-adjuncts are restricted to a higher portion of the clause, in the auxiliary range. If so, the automatic ungrammaticality of extraction from such adjuncts would follow naturally, from the fact that they would always be merged above Op, and so single-event readings would be inaccessible to them. Certainly, this is just the sort of effect that the theory developed in section 2.6 leads us to expect.

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<sup>19</sup>A similar claim has been made for *since* by Dresher (1976), as reported in Hornstein and Weinberg (1981).

To summarise the findings concerning extraction from prepositional participial adjuncts, we have made use of syntactic, semantic and pragmatic factors to account for a complex and only partially understood pattern. A first, syntactic, cut can be made between those prepositions (*since* and *upon*) which necessarily attach too high for extraction, and those (*by*, *before* and *after*) which allow sufficiently low attachment for extraction. Within the latter class, extraction is dependent on the type of relation specified by the preposition, which may be essentially contingent (*by*), and so allow extraction in the general case, or basically noncontingent (*before* and *after*), and so only allow extraction subject to the pragmatic feasibility of an enriched, contingent interpretation. In general, though, the patterns described in this subsection are in line with the predictions made by (18) in conjunction with the theory of event structure developed in chapter 2. On the other hand, they remain a mystery on any account which is purely syntactically driven, as the height effect which distinguishes *since* and *upon* from *before*, *by* and *after* is too coarse to capture the further subtle patterns within this latter class. In the following subsection, the event-structural approach will be confronted with data from a third and final class of verbal adjuncts.

### 3.2.4 Bare Present Participial Adjuncts

#### Bare Present Participial Adjuncts in Declaratives

Bare present participial adjuncts, the final class of adjuncts under investigation here, differ from the other classes discussed above in that they do not contain an overt introducing element parallel to *in order* (section 3.2.2) or a preposition (section 3.2.3).<sup>20</sup> As stated in section 3.1.2, I assume that, in the absence of such an introducing element, the semantic relation between the events described in the matrix and adjunct VPs corresponds roughly to conjunction. Here, though, we need to sharpen this intuitive claim somewhat.

Although this will get more complicated below, I propose initially that, in the absence of an introducing element, an adjunct and a matrix VP may jointly describe a core event, but may *not* jointly describe an extended event. In other words, the possibilities for single event formation are much more restricted in the case of bare present participial adjuncts than is often the case for adjuncts with overt introducing elements. The subevents described by a bare present participial adjunct and the matrix VP to which it is attached must be identified

<sup>20</sup>A large amount of these data have been discussed within a different framework of assumptions in Truswell (2007).



as the two subevents of a single maximal core event if (18) is to be satisfied, and extraction from the adjunct not blocked.

To understand why this should be the case, we need to consider further what is involved in extended event formation. The defining characteristic which sets extended events apart from core events is the availability in the former of enablement relations among subevents, but not in the latter. Furthermore, one of the salient features of enablement, in comparison to causation, is its modal nature. On almost any definition of causation, a cause necessarily brings about its event, at least in the closest possible worlds. On the other hand, the relation between enabling and enabled events is much looser: although the occurrence of an enabling event might well make the enabled event more likely, it does not guarantee its occurrence in the way that a causing event guarantees a caused event.

To make this more concrete, consider again the definition of causation given above, based on Lewis (1973).

- (39)  $e_1$  *causes*  $e_2$  iff  $e_1$  and  $e_2$  both occur, and in the most accessible possible worlds in which  $e_1$  did not occur,  $e_2$  also did not occur.

Now compare this to a canonical case of enablement, as in (165).

- (165) John came to England in order to visit the Queen.

While coming to England certainly increases John's chances of visiting the Queen, in the most accessible worlds in which John comes to England, he still won't get to meet her. It is clear, then, that no statement along the lines of (39) is appropriate for a definition of enablement: the most accessible worlds in which an enabling subevent  $e_1$  happens may or may not be worlds in which  $e_2$  also happens. This can be seen by the ease with which the occurrence of an enabled event is denied, relative to a directly caused event. In this respect, the bare present participial adjunct example in (166c) patterns together with the resultative construction (a classic case of an adjunct participating in relations of direct causation) in (166d), in contrast to the enablement examples (166a–166b).

- (166) a. John came to England in order to visit the Queen, but he never got to see her.  
 b. John emptied the hearth before making a fire, but he never got round to making a fire.

- c. # John drove Mary crazy whistling but he didn't {drive Mary crazy / whistle anything}.
- d. # John hammered the metal flat, but {he didn't do any hammering / the metal wasn't flattened}.

In that case, sentences encoding goal-driven enablement relations, unlike direct causation, lie outside the canonical affirmative non-modal clause type. But it is precisely this unmarked sentence type which is expressed in the absence of morphosyntactic marking. Just as affirmation is unmarked with respect to negation, and nonmodal semantics is unmarked with respect to modal semantics, so direct causation is unmarked with respect to enablement. And so, in the absence of any morphosyntactic marking of the relation between subevents, the only possibility is that the subevents are related by direct causation — extended event formation requires some form of overt marking.

Bare present participial adjuncts are, of course, defined in part by the absence of such morphological marking, or by the absence of an introducing element, in the terms used above. The events described by a matrix VP and a bare present participial adjunct attached to it cannot be construed as related by enablement, in that case. However, the two events are not completely independent. The adjunct is untensed, and is interpreted as temporally dependent on the matrix verb. It is impossible to interpret the matrix and adjunct events as taking place at different times, for example. So (167) can only be interpreted in such a way that the temporal modifier scopes over both the matrix and adjunct subevents, and (168) is contradictory, if not ungrammatical.

(167) John drove Mary crazy whistling on Thursday.

(168) \*/# On Friday, John drove Mary crazy whistling on Thursday.

This actually leaves a fairly narrow range of options for interpreting bare present participial adjuncts. In fact, the following seems to exhaust the set of possibilities.

- (169) a. The matrix and adjunct events are interpreted as conjoined, and temporally overlapping (two separate core events);
- b. The matrix and adjunct events are interpreted as jointly forming a single core event.

We will see that both of these possibilities are in fact attested. The former possibility, (169a), is clearly visible in an example like (170), interpreted as meaning that John listens to music while he does his work.

(170) John works listening to music.

A parallel reading is marginally available in an example like (171), as well, but this time, it is not the most salient interpretation.

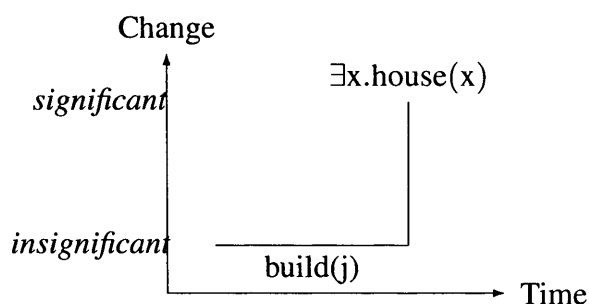
(171) John drove Mary crazy whistling the *Marseillaise*.

A *while*-reading, corresponding to (169b), of the relation in (171) can be brought out by enriching the context, as in (172).

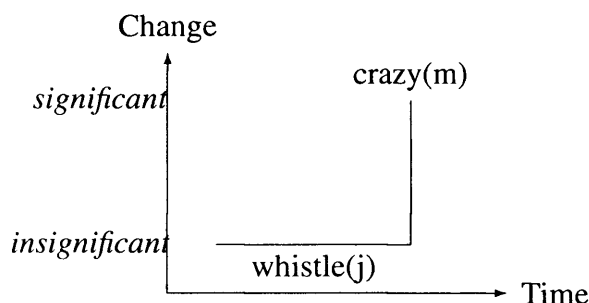
(172) John drives Mary crazy every day, usually by spending hours obsessively cleaning their carpet with a tiny brush, in absolute silence. Yesterday, John drove Mary crazy once again. No surprise there, but instead of doing so in silence, the remarkable thing about yesterday was that John drove Mary crazy whistling the *Marseillaise*.

(172) surely does not represent the most salient reading of (171), however. Instead, (171) is most naturally interpreted as stating that John's whistling is the cause of Mary's craziness. I suggest that this comes about through option (169b): the matrix and adjunct events jointly form a single (core) macroevent. The whistling process described in the adjunct is construed as the direct cause of Mary's craziness. This can be schematised as in (173b), in comparison with the regular accomplishment *John built a house* in (173a).

(173) a.



b.



The obvious question now becomes one of what regulates the different interpretations that we find in (170) and (171). In the former case, an interpretation along the lines of (169a) is salient, and an interpretation along the lines of (169b) is unavailable. In the latter case, both interpretations are available, but the (169b) interpretation is much more natural in a neutral context than (169a). In fact, there is a clear link between these patterns of interpretation and lexical aspect. One frequently observed difference between telic and atelic predicates is that the latter do not have a culmination, Vendler's typical endpoint 'which has to be reached if the action is to be what it is claimed to be' (Vendler 1957:145, see also section 2.3). That endpoint can be seen as a linguistically significant change of state, and so as a prime candidate for the caused event in a structure such as those in (173) — in at least the prototypical case, causal relations bring about just such a change of state, and the hypothesised maximal core event structure of section 2.3 requires that the second subevent of any core event correspond to a pointlike change of state. We may expect, then, that atelic predicates do not have interpretations such as (169b), illustrated diagrammatically in (173), available to them: there is simply no core event structure corresponding to a non-culminating event which nonetheless contains two differentiated, non-culminating subparts. Interpretations such as (169a) are then expected to be the only interpretations available when both the matrix and adjunct predicates are atelic.

Cases of bare present participial adjuncts where both the matrix VP and the adjunct describe atelic events are doomed to be interpreted conjunctively, then. Moreover, it seems that a bare present participial adjunct may not describe a telic event, presumably as a consequence of the semantics of the *-ing* morpheme, which requires that the event described

by the verb to which it is attached is ongoing.<sup>21</sup> If the matrix VP describes a telic event, however, with the adjunct describing an atelic event, option (169b) becomes available.<sup>22</sup> The matrix VP denotes a predicate containing a culmination, and the adjunct can be interpreted as describing the process which leads to that culmination. In that way, the two event-denoting constituents can come to each denote one subevent of a single core event. This leads to a first-pass division, as follows:

- (174) a. Atelic matrix VP: conjoined interpretation of matrix and adjunct events (170) only.
- b. Telic matrix VP: conjoined (172) or single-event (171) interpretations of matrix and adjunct events available.

Moreover, we have seen that, in cases such as (171) above, the default interpretation of the latter case is the single-event reading. This is not always the case, however. Contrast (171) with examples such as those in (175), which consist of the same basic configuration of accomplishment-denoting matrix VP with activity-denoting adjunct.

- (175) a. John painted this picture trying to express his inner rage.
- b. John built his house thinking it would be a nice challenge.

In these latter cases, although it is quite plausible to suggest that trying to express his inner rage might cause John to paint the picture, or thinking it would be a nice challenge might cause John to build the house, the causal relation in these cases is clearly not direct. What brought about the existence of the picture, or the house, is not John's mental state as expressed in the respective adjuncts, but rather the painting and building processes described by the matrix verbs themselves. This suggests that the relation between the events described in the matrix and adjunct VPs in this case is not of the right type to form a single core event: as we have seen above, only relations of direct causation are admissible within core events, and the relationship in these cases is rather *indirect* causation. We must instead

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<sup>21</sup>It may be objected that this cannot always be the case for *-ing*, as shown by example like *John felt sick after eating the oyster*, where the eating event is clearly completed. Certainly, in the morphosyntactic environment of a bare present participial adjunct, however, the claim holds up.

<sup>22</sup>I have no clear explanation for why the single-event reading of this configuration is so often preferred over the conjunctive reading, however.

claim that sentences such as (175) are interpreted along the lines of (169a), in that the two events are interpreted as conjoined, not as the two subparts of a single core event. A fair paraphrase for (175a) may be *John was trying to express his inner rage when he painted this picture*, for example.

Still another pattern can be found by considering bare present participial adjuncts modifying achievement verbs. On the theory presented in sections 2.3 and 2.5, achievements are identical to accomplishments in terms of subevent structure, but are distinguished in that they resist interpretations with agentive preparatory processes. In that case, we might expect single-event readings, similar to (169b), to be available in this case too. In fact, I will argue that such a reading is available, but it is somewhat different from the canonical cases such as (171) above.

To give some concrete examples, consider the following:

(176) a. John arrived whistling the *Marseillaise*.

b. John came back from his travels thinking he was invincible.

In such cases, we do not consider that whistling the *Marseillaise* caused John to arrive, or that thinking he was invincible caused John to come back from his travels. Instead, the relationship is, at first sight, much closer to the conjoined readings as in (169a) than the single-event reading. However, there is a twist in this case. If we consider again a sentence such as (170), it is clear that the working event and the listening-to-music event have to overlap temporally (to a first approximation, we might say that the temporal extent of the working must be a subset of the temporal extent of the listening for (170) to be true). This is not the case in examples following the same aspectual schema as (176), however. To see this, consider the following.

(177) John died whistling *Ode to Joy*.

Temporal overlap is a clearly inappropriate characterisation of the relation between the adjunct and matrix events in this case, as dead men do not whistle. Instead, it seems that the necessary conditions for (177) to be true include a requirement that John was whistling *Ode to Joy* immediately prior to his death. Unlike the genuine atelic cases of temporal overlap such as (170), then, the asserted relation in cases such as (176) and (177) appears to be one of immediate temporal precedence.

With this in mind, consider again (176a). It seems that, in fact, the necessary and sufficient relation in this case is once again one of immediate temporal precedence. To see this, consider the following scenario.

(178) Every day, John walks home from school, whistling a different tune each day as he walks. Today, it was the *Marseillaise*. John's father knows about John's whistling, but never hears which tune he whistles, because John stops the instant he opens the door of his family home. So every day, when he gets home, John tells his father which tune he whistled on the way. Today, John said "Dad, I came home whistling the *Marseillaise* today".

Even though John stops whistling the instant the result state of the predicate *come home* is reached, (178) is a perfectly acceptable statement for John to make in the context. This strongly suggests that, even in cases of questions with matrix verbs such as *come home*, immediate temporal precedence is the necessary and sufficient relation between the two events.

This does not mean that John must stop whistling the minute he arrives for (176a) to be felicitous. Depending on our real world knowledge of the characteristics of certain actions, the normal interpretation of such relations is often, indeed, one where the adjunct event continues through the time of the matrix event. For example, there is no reason for us to assume that John's coming back from his travels in (176b) would stop him from thinking he was invincible. In the absence of any evidence to the contrary, then, we will usually interpret such a sentence as implying that John continues to think that he is invincible after he gets back from his travels. Examples such as (178) show that such an inference is only a cancellable default, however, and not part of the asserted content of an example such as (176b).

A similar observation can be made in the case of the reading of (179) on which the boat floats towards a specified endpoint under the bridge (the *directed motion* reading, as opposed to the *locative* reading, on which the boat is afloat under the bridge, but motionless).

(179) The boat floated under the bridge.

Although the *float* event and the *under* event form a single core event structure as in (173), we do not assume that the boat must cease to float (i.e. sink) the instant it is under

the bridge. Instead, the normal interpretation in this case is one where the floating continues after the boat has reached a position under the bridge. Again, though, this normal assumption can be cancelled, exactly parallel to the case of *come home whistling* in (178) above.

(180) The boat floated under the bridge, and then sank the second it got there.

We saw above that the combination of a bare present participial adjunct and an atelic matrix VP is unambiguously interpreted such that the events described by the two constituents are conjoined, and overlap temporally. And if the matrix VP describes an accomplishment rather than an activity, we find an ambiguity between such a reading, and a causal reading, on which the matrix and adjunct events come to be seen as parts of a single macroevent. In this latter case, the two readings are clearly distinguishable: on the conjoined reading, there is no requirement of a causal component to the interpretation, and on the single event reading, there is also no requirement that the two subevents overlap temporally, as shown by examples such as (181).

(181) John hated the *Marseillaise*, and he also hated Mary. But he knew that she also hated the *Marseillaise*. So he hatched a plan. He would whistle the *Marseillaise* for just as long as was necessary to send her into a foaming rage, and then shut up for the sake of his own sanity. And sure enough, he drove Mary crazy whistling the *Marseillaise*, and stopped the very instant she got really mad.

In the case where the matrix VP describes an achievement, however, it is not so clear whether or not there is an event-structural ambiguity. To be sure, there are interpretations on which the matrix and adjunct events are most naturally interpreted as overlapping (176b), and others in which they are not (177). However, the two readings are not dissociated here as they are in the case of accomplishments, as there is never any causal relationship between these two subevents when the matrix VP describes an achievement. The single-event reading properly includes the conjoined reading, as the matrix and adjunct events on a single event reading of (176a) *can* be interpreted as temporally overlapping, but needn't be.

Does the interpretation of a bare present participial adjunct modifying an achievement-denoting VP consist of a single macroevent, then, or two independent events? There are



reasons to believe either story. On the one hand, a relation of temporal succession among events is insufficient to allow macroevent formation according to the theory of event structure developed in chapter 2. This gives us an initial reason to think that the achievement case illustrated in (177) represents two events, like the activity case in (170). However, I will present a natural modification to that theory below, building on the concerns raised in section 2.6, according to which examples such as (177) or (176a) may be construed as, roughly, a single event. Certainly, the temporal profile of an example like (177) is identical to the single event reading of an accomplishment-based example like (171), and quite distinct from a clearly conjoined case such as (170), in that the two subevents in both (177) and (171) must stand in a relation of immediate temporal precedence, such that the process precedes and abuts the culmination. Furthermore, in both the accomplishment and achievement cases, we may naturally interpret the process as continuing past the point of the culmination, although this default inference is cancellable. In contrast, the two events in (170) must overlap, and not just abut, each other. The parallels between the temporal profiles of the accomplishment and achievement cases therefore constitute an argument in favour of treating them as a natural class, with single-event readings available in both the accomplishment and achievement cases. This tentative conclusion will be strengthened immediately below, when we turn to the extraction data concerning bare present participial adjuncts. I will also develop the promised modification to chapter 2's theory of event structure there. For now, then, I will claim that a bare present participial adjunct and an achievement-denoting VP that it modifies can jointly denote a single event,<sup>23</sup> and discuss the theoretical ramifications of this claim later in this section.

### **Extraction from Bare Present Participial Adjuncts: The Basic Patterns**

By now, we have found several distinctions in the interpretation of bare present participial adjuncts, based primarily on the aspectual class of the VP which the adjunct modifies. Bare present participial adjuncts modifying matrix accomplishments and achievements form a natural class, to the exclusion of activities, in allowing a single-event reading. And the accomplishment case is distinguished from the achievement case in that it requires that the

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<sup>23</sup> Although there is no clear way, on this theory, of telling whether bare present participial adjuncts modifying achievement-denoting VPs also have a conjoined reading parallel to (172), it is natural to suppose, by parallelism with the accomplishment case, that they do. I am unaware of any way to test this supposition, however.

(182) a. What did John arrive [whistling  $t$ ]?  
b. What did John die [thinking about  $t$ ]?  
c. Which clothes did John come back [wearing  $t$ ]?  
(183) a. What did John drive Mary crazy [whistling  $t$ ]?  
b. What did John cut himself [carving  $t$ ]?  
c. What did John turn the house upside down [looking for  $t$ ]?

(184) a. ?? What did John paint this picture [trying to express *t*]?  
b. \* What did John build this house [thinking (about) *t*]?

<sup>24</sup>The achievement case, together with a subset of the accomplishment data, in which the matrix object is a reflexive anaphor, were first noted, to my knowledge, by Borgonovo and Neeleman (2000). The reflexivity of the accomplishment cases they discussed played a prominent role in the theory they developed to account for those cases. The existence of cases of extraction with non-reflexive matrix objects such as those discussed in (183) therefore constitutes a serious challenge for that theory.

- (186) \* Which magic hat does John know Georgian [wearing *t*]?<sup>25</sup>

(187) a. What did John lie around [reading *t*] all day?

- c. What was John walking about [whistling *t*]?

<sup>25</sup>In the vast majority of cases, a bare present participial adjunct modifying a state-denoting VP is ungrammatical even in the declarative. The contrast between this example and *?I only know Georgian wearing THIS magic hat* is the nearest I have found to a minimal pair in this configuration. Thanks to Annabel Cormack for this example.

### The Event Structure Presupposition Hypothesis

We have seen in section 2.5 that accomplishments and achievements are distinguished by agentivity, but are built around the same event structure. In the previous subsection, we have seen that the two classes share the same temporal profile in cases of extraction, but differ as to whether the relation between the two subevents is interpreted as causal or not. Moreover, the distinction between the class of accomplishments represented in (175) and those represented in (171) can be thought of in related terms. Cases such as (171) are ones in which the matrix accomplishment leaves open the precise nature of the agentive preparatory process, instead only describing the culmination reached as a result of that process, while the process is fully specified in the examples in (175), as a result of the use of a verb such as *paint* or *build*. This means that the direct causal relationship found between the matrix culmination and the adjunct process in (171), but not (175), is related to the fact that there are two distinct fully specified agentive processes in the (175) examples, but not in (171). Finally, it can be seen that the distinction between the two sets of activity examples in (185) and (187) is also related to agentivity. In each of the (185) examples, both the matrix and adjunct processes are agentive, while the cases in (187) are distinguished by the fact that one of the two processes (lying around, sitting on a chair, and walking about<sup>26</sup> respectively) is always nonagentive.

At an abstract level, then, the common theme uniting the three problems highlighted here is that each distinction, whether an interpretive one (as with the accomplishment–achievement distinction) or a difference in grammaticality (as with the distinctions among subclasses of accomplishments or activities with respect to extraction from the adjunct) is related to the number of agentive processes present in the representation, and the extent to which they are specified. Achievements have a nonagentive preparatory process while accomplishments have an agentive preparatory process; those accomplishments which allow extraction from attached bare present participial adjuncts are distinguished from those that don't in that the nature of the agentive process component of the matrix accomplishment is unspecified when extraction is allowed; and those pairs of activities which allow extraction are distinguished from the others in that one of the activities is nonagentive.

This is where the structures discussed in section 2.6 come in. Although the theories of Kamp, Lasersohn and Winter come from quite different empirical and theoretical per-

<sup>26</sup>I will return to the justification for the claim that this is nonagentive below.

spectives, and although the three differ in formal implementation (and may even turn out to be mutually incompatible), the one conclusion which emerges saliently from all three lines of research is that there is a necessity for some further structure in the domain of events, whether that structure be cashed out in terms of integration with a higher-order type theory (Kamp, who I follow in this thesis for sheer expository convenience), definition of privileged sets of *simple* and *uniform* events within the general lattice of events (Laserson), or the introduction of tuples as semantic objects (Winter). Call such a structure, however it is ultimately formalised, an *event grouping*. I now propose to reformulate (18) in terms of such event groupings, as follows. As this is also the final modification to which (18) will be subjected, I will also give it a name at this point.

**(188) The Event Structure Presupposition Hypothesis: Locality domains for *wh*-movement are partially defined in event-structural terms**

*Wh*-questions carry a presupposition that the minimal constituent containing the head and the foot of the chain describes a single *event grouping*. *Wh*-movement is permitted only if the denotation of that minimal constituent can be construed accordingly.

Of course, such a hypothesis is only any use to the extent that we flesh out what is, and what isn't, an event grouping. I propose the following:

(189) An *event grouping*  $\mathcal{E}$  is a set of core events and/or extended events  $\{e_1, \dots, e_n\}$  such that:

- a. Every two events  $e_1, e_2 \in \mathcal{E}$  overlap spatiotemporally;
- b. A maximum of one (maximal) event  $e \in \mathcal{E}$  is agentive.

For clarity, I add the following:

(190) An event  $e$  is *agentive* iff the subject performs the initial subevent of  $e$  (or  $e$  itself, if it does not have any subevent structure) agentively.

This set of definitions is simply an extension of the project undertaken in chapter 2. The algebraic model of the domain of events developed in Link (1983) and Bach (1986) gives us an extremely general picture of how that domain is structured. This model contains a great many possible individual (or event) denotations which do not correspond to the way in

which our cognitive systems regularly package things into individuals (or events), however. Under normal circumstances, I do not jointly form an individual with Hercules and Mongolia, but the me-Hercules-Mongolia triad is an admissible individual denotation in Link's system. Similarly, Bach's extension of Link's theory to the domain of events may well class as single macroevents those configurations of events which section 2.2 endeavoured to show that we could not treat as such.

This is not a criticism of Link and Bach, of course. Rather, my aim here is simply different from theirs in the papers in question. Link and Bach describe the structures which we need to posit within the relevant domains in order to capture the mereological relations which we find therein. On the other hand, I am interested in the ways in which we use those structures, and more precisely in characterising the subparts of those structured domains which we readily take to correspond to a single event (or individual). Throughout section 2, the claims about the upper bounds of single events were supported by intuition, by simple thought experiments, and by experimental results reported in the literature. As far as I am aware, though, there is no such evidence available for treating the distinctions discussed in this section in terms of the upper bound on the size of single events. This is also one reason for introducing the operator *Op* in section 2.6. There is nothing to prevent us formally from continuing to define such groups of events in terms of macroevent-subevent relations within the lattice structures defined by Link and Bach (as Lasersohn, for example, arguably has), but there comes a time where it becomes more natural and more cognitively plausible to define the structures relevant for locality in terms of grouping operations over macroevents, rather than subevents. Although there is no *formal* reason not to continue to consider the data discussed in this section as evidence about the upper bounds of single events, then, I have chosen to introduce a new term, an *event grouping*, in order to reflect the fact that the structures which are proving to be relevant to the extraction patterns have gone beyond those which we have independent reason to class as single events. This slight complication to the theory of locality presented here is not, however, damaging in itself to the central claim of this thesis, that certain locality effects can be explained in simple event-structural terms which do not have straightforward phrase-structural analogues.

We can now return to our three puzzles, armed with our revised locality theory (188–190). It can be seen that all three sets of data are now as predicted. The easiest case is, without a doubt, the activity case. Here, we saw that extraction was possible from a bare

- This is, of course, exactly what we expect on the definition of event groupings in (189). Although the examples in both (185) and (187) each describe two overlapping events, the nonagentive nature of one of the two events in each example in (187) makes it possible to group those events into a single event grouping. However, in the cases in (185), all the processes are agentive, and so it is impossible, on the above definitions, to contain both the matrix and the adjunct event within a single event grouping.

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in (187c).<sup>27</sup>

(191) \* John (deliberately / intentionally) walked around (on purpose).

We see, then, that the Event Structure Presupposition Hypothesis correctly predicts the split between acceptable and unacceptable cases of extraction from a bare present participial adjunct modifying an activity VP. Moving on to the split in the accomplishment cases, we find that a very similar story holds true here. In those cases where a bare present participial adjunct modifying an accomplishment-denoting VP allows extraction, as in (183), the process component of the matrix accomplishment is underspecified. We know, by virtue of the definition of *accomplishment* in section 2.5, that the process is agentive, but that's all we know. On the other hand, in those cases which prohibit extraction, the matrix accomplishment already has a process component with a fully specified manner component, as in (184).

(183) a. What did John drive Mary crazy [whistling *t*]?  
 b. What did John cut himself [carving *t*]?  
 c. What did John turn the house upside down [looking for *t*]?  
 (184) a. ?? What did John paint this picture [trying to express *t*]?  
 b. \* What did John build this house [thinking (about) *t*]?  
 Here, (189) does not automatically make the right distinction. At first sight, there are two agentive preparatory processes in both the (183) and (184) cases. However, I claim that the crucial difference here comes from the underspecification of one of those processes in the (183) cases. This underspecification makes it possible to unify the two processes, in such a way that the process described in the adjunct comes to be interpreted as the direct cause of the culmination described in the matrix VP. I will set aside the question of exactly how this is achieved compositionally for now, but it is clear that something like this must be possible, if we are to account for the ambiguity between single-event (171) and conjoined

<sup>27</sup>One qualification is in order here. Although (191) is clearly degraded, an example such as *John deliberately walked around whistling* is quite acceptable. In fact, I believe that in such cases, *deliberately* modifies the agentive adjunct event, *whistling*, rather than the nonagentive *walk around*. See section 3.4.4, where a similar set of data is discussed, for justification of this position.



(172) readings described earlier in this section. Moreover, it is equally clear that such an identification will fail in the (184) cases. A housebuilding event is not a thinking event, and a painting event is not a trying-to-express event, and so the unification of the two events will not succeed because of their incompatible descriptive contents. But a whistling event *can* be the (otherwise unspecified) process component of a driving-Mary-crazy event, and so the unification of the two process components is possible in that case. Moreover, as both of the distinct processes in the (184) case are agentive, they cannot be contained within the same event grouping, following (189). The Event Structure Presupposition Hypothesis correctly predicts the split in acceptability between the (183) and the (184) cases, then.<sup>28</sup>

We can now turn to the final puzzle, concerning the admissibility of extraction from bare present participial adjuncts modifying achievements, and the interpretation of the resulting structure. We saw above that it is implausible to consider the matrix and adjunct events as jointly forming a single core event in this case, as the preparatory process associated with the matrix event is, by definition, nonagentive, yet the adjunct processes in question were generally agentive. However, the temporal profile of a bare present participial adjunct modifying an achievement VP is identical to the single-event reading in the accomplishment case, and extraction proved to be just as possible for the achievement case as for the accomplishment case. Moreover, there is a clear interpretive difference: the causal relation that we found between subevents in the accomplishment case is replaced here by a relation of immediate temporal precedence. The relevant examples are repeated below.

- (182) a. What did John arrive [whistling *t*]?  
b. What did John die [thinking about *t*]?  
c. Which clothes did John come back [wearing *t*]?

We can now make sense of this pattern in the following way. Following the discussion

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<sup>28</sup>One puzzling prediction made by the current approach is that extraction from a bare present participial adjunct modifying an accomplishment should be possible, regardless of the descriptive content of the matrix VP, if the adjunct event is nonagentive. The support for this prediction is equivocal. On the one hand, cases like *What did John paint this picture sitting on?* or *What did John build this house wearing?* are much more acceptable, at least to my ears, than those in (184). However, a parallel modification to the (183) cases *degrades*, if anything, the sentence — certainly examples such as *?? What did John drive Mary crazy sitting on?* or *?? What did John turn the house upside down wearing?* are much less natural than those in (183). This may indicate that the agentivity requirement included in the definition (189) of event grouping needs some tweaking, or it may indicate that extraction from a bare present participial adjunct somehow forces the single event reading whenever the aspectual class of the matrix verb allows. I leave the matter aside here.

in section 2.5, I assume that achievements are distinguished by the presence of an obligatorily nonagentive preparatory process. Meanwhile, the process described by the adjunct is generally agentive. The two cannot jointly form a single event, in that case. However, the nonagentivity of the preparatory process associated with the achievement ensures that the two *can* form a single event *grouping*, regardless of the status of the adjunct event with respect to agentivity. We therefore predict extraction to be possible from such a configuration according to the Event Structure Presupposition Hypothesis (188).

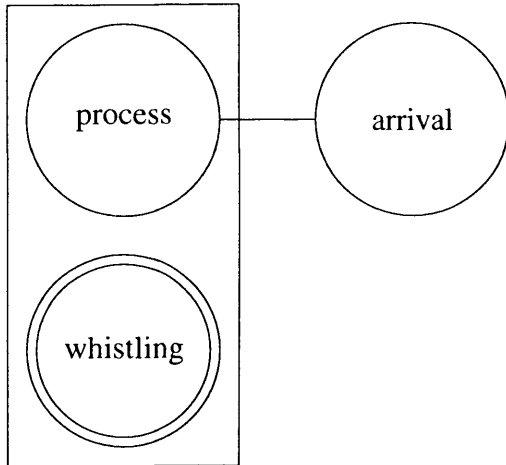
Regarding the interpretation of such an event grouping, the definition (189) of event groupings tells us that events contained within the event grouping must overlap spatiotemporally. Moreover, we know that the immediate cause of the culmination described by the achievement is the nonagentive preparatory process with which it forms a core event. The adjunct event, being agentive, *cannot* be a direct cause of that culmination, in that case, but it must spatiotemporally *overlap* with that cause. This is the reason for the interpretation of immediate temporal precedence obligatorily associated with cases of extraction from a bare present participial adjunct modifying an achievement-denoting VP.<sup>29</sup> Diagrammatically, the space of possibilities for extraction out of bare present participial adjuncts is the following.<sup>30</sup>

<sup>29</sup>This raises the question of why a nonagentive adjunct event, such as the one in (182c), also can't be interpreted as the cause of the matrix culmination. In this case, I have to appeal to real-world knowledge. Unlike the accomplishment case, nothing forces the causal link in this case. And given the implausibility that wearing a particular outfit caused John to come back in (182c), it is natural that the causal interpretation is still resisted.

<sup>30</sup>The diagrams should be read in the following way: each diagram consists of a series of circles, representing events. In each diagram, there are two rows of circles. The top row represents the denotation of the matrix VP, while the bottom row represents the adjunct VP. Events connected by horizontal lines represent the subevents of a core event. If two events are aligned such that one is immediately beneath the other, enclosed within a box, those two events cooccur. Vertical bars linking two circles represent identification of the two corresponding events. Finally, a circle drawn with a double line represents an agentive event, while a single line represents a nonagentive event.

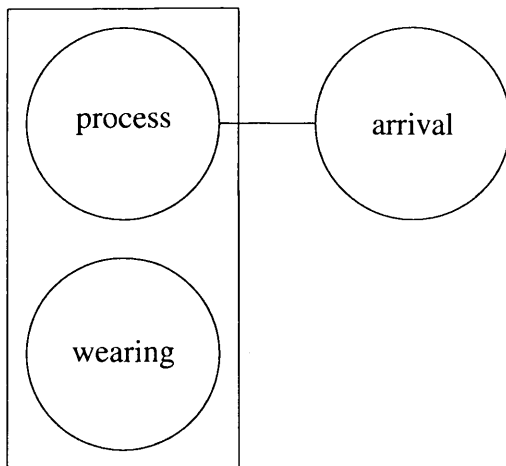
(192) a. **Nonagentive culminated process with agentive adjunct event**

*e.g. What did John arrive whistling?*



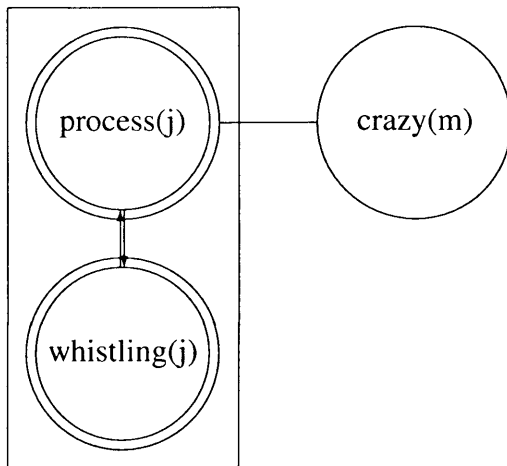
b. **Nonagentive culminated process with nonagentive adjunct event**

*e.g. What did John arrive wearing?*



- c. **Agentive culminated process with agentive adjunct event identified as the preparatory process of the matrix event**

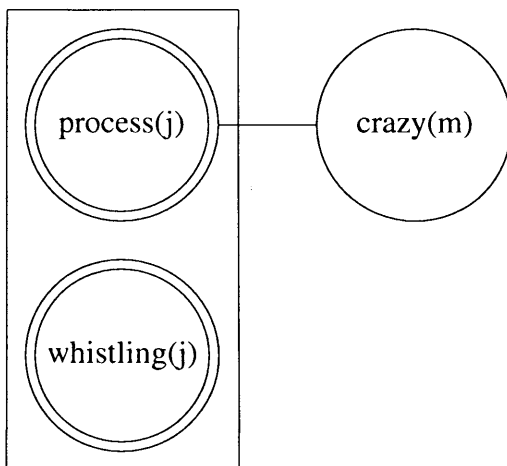
*e.g. What did John drive Mary crazy whistling? (causal reading)*



- d. **\* Agentive culminated process with agentive adjunct event, no identification**

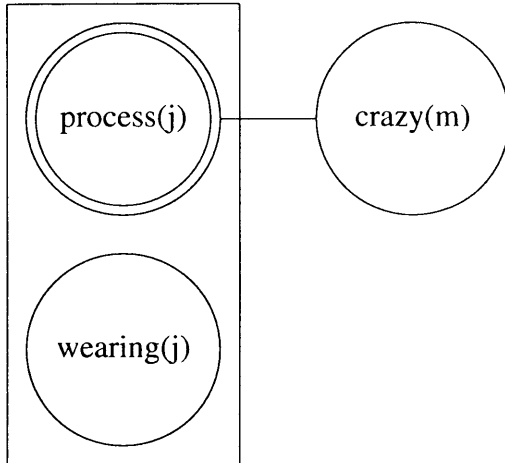
*e.g. \*What did John drive Mary crazy whistling? (no causal relation between John's whistling and Mary's craziness)*

Violates the condition that at most one event in an event grouping is agentive.



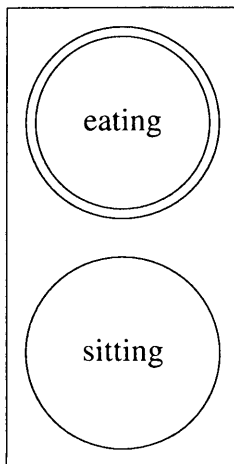
**e. Agentive culminated process with nonagentive adjunct event**

*e.g. What did John drive Mary crazy wearing?*



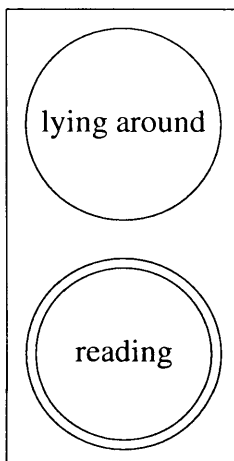
**f. Agentive matrix process with nonagentive adjunct process**

*e.g. Which chair did John eat his breakfast sitting on?*



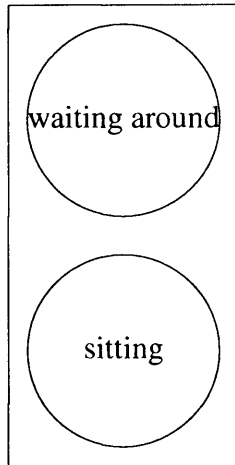
**g. Nonagentive matrix process with agentive adjunct process**

*e.g. Which book did John lie around reading?*



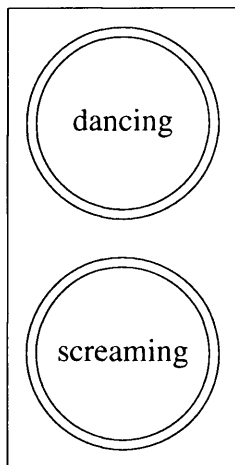
h. **Nonagentive matrix process with nonagentive adjunct process**

*e.g. What did John wait around sitting on?*

i. **\* Agentive matrix process with agentive adjunct process**

*e.g. \*What does John dance screaming?*

Violates the condition that at most one event in an event grouping is agentive.

**Prepositional Participial Adjuncts Revisited: The Case of *Without***

An interesting further application of the new locality theory based on event groupings can be found by considering a further class of prepositional participial adjuncts, involving the preposition *without*. I omitted discussion of this class from section 3.2.3 as they pattern quite differently from the cases of extraction from a prepositional participial adjunct discussed there. Firstly, extraction from a *without* participial adjunct does not require the same contingent relation among subevents which was claimed to be necessary in the case of other prepositional participial adjuncts. Secondly, extraction from a *without* participial adjunct is quite simply easier than extraction from other prepositional participial adjuncts. Many

speakers who reject most examples in section 3.2.3 nonetheless allow extraction from a *without* adjunct, and even those speakers who accept the earlier examples frequently express a preference for the *without* case. Examples are given below.

- (193) a. Who did you go home [without speaking to *t*]?  
 b. What has John designed this house [without considering *t*]?  
 c. Which problem could you go a whole day [without thinking about *t*]?

We can now make sense of this pattern in the following way. Unlike the prepositions considered in section 3.2.3, the temporal relation among events specified by *without* is essentially simultaneity. However, the meaning of *without* also specifies that the adjunct event does *not* occur. A sketch of the meaning of two verbal phrases related by *without* therefore consists of the following elements:

- (194) a. An event grouping  $\mathcal{E}$  consisting of...  
 b. An event  $e_1$  described by the matrix VP, which occurs simultaneously with...  
 c. An event  $e_2$  described by the adjunct, which consists of...  
 d. The non-occurrence of an event  $e'_2$ .

Such an event grouping is expected to be legitimate with respect to the Event Structure Presupposition Hypothesis (188), so long as one of the events in question is nonagentive. The obvious candidate for this nonagentivity is the adjunct event. It is clear that negating an event is capable of rendering it nonagentive. For example, although building a house is always a deliberate activity, *not* building a house can be a deliberate activity or not, depending on nonlinguistic factors.<sup>31</sup> For a builder at work, not building a house is tantamount to

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<sup>31</sup>This claim has a clear similarity to Verkuyl's (1993) discussion of the stativity of negated events. Verkuyl's result, which has substantial empirical support, is broadly compatible with my position here, as states are almost by definition nonagentive. Such a unification would also give us some insight into the behaviour of a further class of adjuncts, namely those formed around *past* participial verb forms. As (i–ii) show, extraction is quite readily possible from such examples, with only a slight preference for a subject-oriented interpretation of the adjunct, and initial investigation suggests that extraction from such adjuncts is at least as readily possible as extraction from bare present participial adjuncts.

- (i) What did John come home [covered in *t*] yesterday?  
 (ii) What did the chef<sub>i</sub> serve the meat<sub>j</sub> [wrapped in *t*]<sub>i/??</sub>

deliberately going on strike, whereas I have lived my whole life without building a house, as much by accident as by design.

We therefore predict that examples such as those in (193) should be legitimate if the adjunct event takes place nonagentively. Unfortunately, although consideration of examples such as (193) suggests that this is broadly correct, it is hard to find conclusive evidence in favour of this correlation in this case: for example, there is no attachment site for agent-oriented adverbs which targets specifically the level of *without*, at which the adjunct event is negated, rather than targeting the adjunct event itself or the whole complex of matrix and adjunct events. This is shown in (195).

(195) a. John [deliberately [went through the day without looking at Bill]].

b. John went through the day without [deliberately [looking at Bill]].

c. \* John went through the day [deliberately [without looking at Bill]].

I must leave confirmation of the analysis of *without* participial adjuncts for future research, then. However, in general, this section has shown that a natural expansion of the event structure proposed in chapter 2 is sufficient to give an empirically accurate description of the distribution and interpretation of cases of extraction from bare present participial adjuncts, explaining the interaction of several semantic factors, primarily the aspectual classes of the verbs in question, coupled with the agentivity of the subject with respect to the two subevents. It should also be emphasised that none of the results of the previous two subsections are lost: a proper extension of the class of event structures allowing extraction will not affect our early claim that *in order* clauses allow extraction quite generally (section 3.2.2), and that, *since* and *upon* aside, the prepositions discussed in section 3.2.3, on their noncontingent readings, specify relations of temporal precedence, not overlap, among events, which means that the matrix and adjunct events in such cases will never be able to form event groupings, for which spatiotemporal overlap is required. Extraction from such adjuncts is still restricted to the enriched, contingent interpretation, in that case.

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This would make sense if the events described by such forms are inherently stative, and so by definition nonagentive. The permeability of bare past participial adjuncts and *without*-participial adjuncts would then be derived from a common source. However, I shy away from adopting this extension of Verkuyl's theory here, as the most natural treatment of states under the theory of event structure proposed above is to claim that they simply lack a spatiotemporal location, as noted in section 2.3, which would also exclude them from the current definition of an event grouping, where spatiotemporal overlap is a prerequisite.



As the theory of locality embodied in the Event Structure Presupposition Hypothesis is a semantic one, there is no clear reason to expect it to apply to adjuncts of only one syntactic category. This subsection investigates one extension of the theory's scope beyond verbal adjuncts. In fact, by far the best known case of extraction from adjuncts in English involves preposition-stranding by movement of the DP complement of a preposition, as illustrated in (196b).

- Although both of these cases are united in showing the configuration [PP P t], itself impossible in the majority of languages,<sup>32</sup> the examples differ further in that while (196a) represents extraction out of an argument of *talk*, (196b) allows extraction from an adjunct, and so is, initially at least, doubly perplexing.

<sup>32</sup>See van Riemsdijk (1978), Hornstein and Weinberg (1981), and Abels (2003), among others, for descriptions of the rarity of P-stranding. It is fair to say that the reasons for this rarity remain a mystery, however.

addition of a regular prepositional phrase specifies a further optional individual argument of the eventive predicate described by the VP, but does not introduce a new event variable. Ignoring tense, and so ignoring any contribution of the factors discussed in section 2.6, we may represent the difference between (197a) and (197b) as in (198) — although there is an extra property predicated of the event variable, there is still only one such variable.

(197) a. John danced.

b. John danced with Mary

*Who did you dance with  
# without*

(198) a.  $\exists e.(e = \text{dance}(j))$

b.  $\exists e.(e = \text{dance}(j) \wedge \text{with}(e, m))$

In the majority of cases, then, adding a PP does not change the event structure of the example, and so extraction is predicted to be possible.<sup>33</sup> However, there are exceptions. Three prepositions which typically take event-denoting nominal complements are *notwithstanding*, *despite*, and *during*, as illustrated in (199). Moreover, these events generally do not stand in contingent relations with the matrix events. Accordingly, they do not automatically allow extraction of their complement, as shown in (200).

(199) a. I will be here on time, notwithstanding disruptions *en route*.<sup>34</sup>

b. I will be here despite the disruptions.

c. I read a book during lunch.

(200) a. \*What do you expect to get there [notwithstanding *t*]?

b. \*What do you expect to get there [despite *t*]?

<sup>33</sup>This is even true in the case of bounded and unbounded path- and place-denoting PPs, according to Ramchand (2006). It seems that in Ramchand's system, such PPs never directly affect the subevent structure of a given example by adding or removing subevents, but rather place additional constraints on independently selected subevents, for example stating that a process must be bounded or unbounded, as appropriate. For Ramchand, then, such PPs only indirectly affect event structure through a measuring-out effect.

<sup>34</sup>Once again, there are complicating factors with this case stemming from the necessity of a parenthetical prosody on the adjunct, and also from the fact that *notwithstanding* is perhaps most frequently used as a postposition, both of which (in addition to its greater morphophonological weight than most prepositions) make the analysis of this particular case quite fraught. Once more, though, these problems do not apply to the other cases at issue here.

c. \* Which meal did you read a book [during *t*]?

Moreover, the same sort of factors which were shown to ameliorate extraction from prepositional participial adjuncts in section 3.2.3 also affect at least the *during* case illustrated in (200c). In that example, the two events of reading and eating are too independent to naturally be interpreted as contingently related. However, other examples do not suffer from this problem. Consider the following:

(201) John fell asleep during *Tamburlaine*.

It is quite plausible that, in this case, there *is* a contingent relation between the two events in question. Depending on John's theatrical persuasions, it is quite possible that he would find *Tamburlaine* dull enough to send him to sleep. If so, the two events are causally related, and suddenly, extraction becomes possible, at least for some speakers.

(202) % Which play did John fall asleep [during *t*]?

Regarding the unavailability of parallel strategies for rescuing (200a–200b), we may hypothesise that the adverse events which are felicitous as complements of *notwithstanding* and *despite* are necessarily too independent of the matrix event to be rescued in the same way: the complements of *notwithstanding* and *despite* describe a *hindrance* to the occurrence of the matrix event, which almost by definition cannot simultaneously participate in the causal and enablement relations which underpin macroevent formation.

Although this is far from a comprehensive account of the P-stranding data, of course, it does show that it is at least theoretically possible to extend the Event Structure Presupposition Hypothesis to cover non-verbal adjuncts as well as the verbal cases discussed above. In this light, it is worth noting that reanalysis-based theories of P-stranding (see, for example, Stowell 1982) have generally included a semantic component in the conditions on applicability of the reanalysis rule, to the effect that the output of reanalysis must be a “possible (or semantic) verb”, in some more or less well-defined sense.<sup>35</sup> However, the assumption remained that reanalysis itself is a syntactic operation, manipulating the phrase-structural and

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<sup>35</sup>The theory of Hornstein and Weinberg (1981) is a notable exception to this claim. Hornstein and Weinberg claim that there is a free, optional operation which reanalyses V and any amount of VP-internal material to its right as a single verb. The “semantic verb” condition is then relocated to a separate operation of “predication”, which is only relevant to P-stranding by A-movement in pseudopassive cases. This is in contrast to the theory of van Riemsdijk (1978), for example, which derives the distinction between the relatively restricted distribution of the pseudopassive and the relatively free distribution of A' P-stranding by adopting a

X'-theoretic status of particular nodes in the tree. As well as clarifying the notion of *possible verb*, by giving it some explicit falsifiable content in terms of independently motivated theories of event structure, the strong claim here is that there is no need for a *syntactic* reflex of the manipulation of event variables, but instead that the semantics and pragmatics can directly influence the acceptability of a case of *wh*-movement, without committing us to any particularly controversial assumptions about the modular architecture of the language faculty, by acting as a filter on the output of the syntactic component. It is worth pointing out, following Hornstein and Weinberg (1981), just how unconstrained any syntactic reanalysis rule would have to be to cover all cases of A' extraction from prepositions, and how wildly the rule would overgenerate in the absence of what appear to be purely semantic constraints on its application. As the constraints are purely semantic, and as the only syntactic reflex appears to be a weakening of island boundaries, I argue that a more parsimonious picture emerges by bypassing the syntactic instantiation of the reanalysis operation, and instead relating *wh*-movement directly to event structure.

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semantically constrained reanalysis rule, but analysing the A' case in terms independent of reanalysis, making reference to the distribution of COMP positions within PP. Both theories are exempt from the discussion in the main text, then. However, both have their empirical drawbacks. See Hornstein and Weinberg for criticism of Riemsdijk's programme of reducing the distribution of A' P-stranding to PP-internal structural factors. On the other hand, Hornstein and Weinberg's theory suffers from quite complementary problems. Firstly, the actual domain of applicability of reanalysis remains a mystery, as it certainly does not apply completely freely to base-generated VP-internal strings, as Hornstein and Weinberg (fn.9, p.60) acknowledge. Secondly, Hornstein and Weinberg have to resort to some quite unpalatable assumptions to explain the acceptability of certain apparent cases of VP-external A' P-stranding, as in (i–iii).

- (i) What day did John leave on?
- (ii) Which act did John leave the theater before?
- (iii) Which act did John leave the theater after? (Hornstein and Weinberg 1981:79, attributed to David Pesetsky)

Hornstein and Weinberg claim that such examples are actually ungrammatical but interpretable. However, if we admit that speakers readily produce, comprehend, and accept sentences which are actually ungrammatical, then we are at a loss to determine the empirical goal of the theory of grammar: exactly which data are we trying to capture, and which ungrammatical but otherwise fully acceptable data is not actually our problem?

Ever since Ross' original definition of *island*, it has been recognised that the complement is a privileged domain for extraction, relative to the subject or the adjunct. There is a lot of truth in this assumption, to the extent where it is probably fair to say that extraction from complements is usually possible, while extraction from subjects and adjuncts is usually impossible. As always, however, things are more complicated than that. We have seen several cases above where adjuncts permit extraction. This section takes the opposite tack and discusses those cases where complements exceptionally disallow extraction.

(132) a. John went home [before he talked to Mary].  
b. John went home [after he talked to Mary].  
c. John fell asleep [while he was talking to Mary].  
d. John is talking to Mary [so that she will understand how he feels].

(203) a. \* Who did John go home [before he talked to *t*]?  
b. \* Who did John go home [after he talked to *t*]?

- c. \* Who did John fall asleep [while he was talking to  $t$ ]?  
 d. \* What is John talking to Mary [so that she will understand  $t$ ]?<sup>36</sup>

In fact, there is an explanation for the absence of extraction from tensed adjuncts which is quite straightforward. We may assume that whatever formal mechanism lies behind the formation of the event groupings described in section 3.2.4, it is only available when the event variables in question are  $\lambda$ -abstracted. Furthermore, we saw that part of the function of that event-grouping mechanism, called Op in section 2.6, is to existentially close the event variables in question. We also saw that Op plays a crucial role in the derivation of temporal intervals from an ordered set of events. This means that the introduction of a tense node depends on the prior application of Op (section 2.6.4). In that case, a tensed adjunct is one within which relations among events are already fixed: we cannot further manipulate the event variables within a tensed adjunct, and identify them as part of a larger macroevent structure with the matrix event, for example. As, even on the revised locality conditions in (188), such structure formation is a prerequisite for extraction, we derive the fact that extraction is impossible from tensed adjuncts.

Moreover, this pattern is not restricted to tensed adjuncts, but also includes other classes of adjunct which demonstrably contain layers of functional structure above the VP. Of course, this is exactly as expected on the approach to the relation between temporal structure and event structure sketched in section 2.6. On that approach, it was suggested that auxiliaries merge above Op, while generation of a single-event reading is contingent on the requirement that Op has not yet merged. Accordingly, we predict paradigms such as the following. By comparing (204a) and (204c), we see that addition of a modal within the verbal adjunct leads to sharp degradation. This cannot be due to factors relating to the basic declarative structure, however, as (204d) is relatively acceptable. It also cannot be due to an outright ban on further material occurring within the adjunct, say, or adjacency effects

<sup>36</sup>A plausible alternative hypothesis is that these questions are degraded because of the presence of a subject within the adjunct. Deciding between these two hypotheses depends on the status of examples such as % *What did we come all this way without Bill noticing?*, which include extraction across a subject within a nonfinite adjunct. Judgement is, as ever, divided on the grammaticality of such examples. This is one of the most widely accepted such configurations, yet even so, most speakers reject it. However, the fact that a few speakers consider such examples at least marginally acceptable leads me to suspect that other factors are also at work here, and that extraction across subjects in nonfinite adjuncts is at least sometimes possible. In contrast, I haven't found anyone who accepts the sentences in (203). In that case, the extractions from tensed adjuncts would be degraded as a result of the presence of a T head, not a subject.

on the two VPs, as the addition of a manner adverb in (204b) is also relatively acceptable. The natural conclusion, then, is that the degradation of (204c) is specifically due to the effect of the modal. This is exactly as predicted by the interaction of the Event Structure Presupposition Hypothesis with the theory of Op sketched in section 2.6.

- (204) a. What would John maybe run around [screaming about *t*]?  
b. ? What would John run around [frantically screaming about *t*]?  
c. \* What would John run around [maybe screaming about *t*]?  
d. ? John would run around [maybe screaming about the pain he's suffering].

I take it to be a significant result for the theory presented here that it can explain the negative effect of tense and modal auxiliaries on the acceptability of extraction in these cases. The interaction between tense and locality has long been recognised, for example by Ross (1967, §6.1.3) and Kluender (1992), but it has always been less clear why it should have an effect in just a few areas such as this:<sup>37</sup> as (205) shows, a tensed complement clause isn't even a weak island: it is still possible to extract non-DP constituents. Moreover, extraction from even an untensed subject is generally impossible,<sup>38</sup> as shown in (206).

(205) Where did John say that Mary had been?

(206) \* Who did [seeing *t*] make you feel better?

However, now we have a theory which does such a good job of banning extraction across tense, there is a pressing need to demonstrate that this position is not vastly over-restrictive. The next subsection shows a way to keep this result while simultaneously allowing extraction from some tensed complement clauses.

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<sup>37</sup>Ross leaves the effect of finiteness as an essentially unexplained puzzle, while Kluender builds an intriguing story on a theory of the processing of predicate–argument structures, which is potentially compatible with the approach developed here but has less to say about why tensed complements of bridge verbs, for example, readily allow extraction.

<sup>38</sup>See Starke (2001), Sauerland and Elbourne (2002), Levine and Sag (2003) and Chomsky (2004) for a few exceptions to this claim, discussed further in section 3.4.5, as well as Stepanov (2007) for a broader crosslinguistic survey.

### 3.3.2 Why Tensed Complements are Different

The previous subsection concluded that merger of a T head or auxiliary required prior application of the operator Op described in section 2.6, which existentially quantifies an event variable, closing off the possibility of manipulation of that variable to form a larger event grouping and essentially creating a strong island for movement. The standard examples of extraction from a clausal complement of a bridge verb, such as (207), appear at first sight to flatly contradict that claim.

- (207) a. Who did John say [that Mary kissed *t*]?  
 b. Who does John think [that Mary kissed *t*]?

In each case, the complement clause is tensed, but extraction is still possible. The aim of this subsection is to show how this can be so, without losing the results of the previous subsection. In a nutshell, I wish to claim that the distinction is due to the semantic and pragmatic status that the complement clause has relative to the rest of the sentence. We saw above that, as tense requires prior application of Op, which binds the event variable in its scope, an event described by a tensed adjunct is asserted to exist independently of the matrix event, this assertion being essentially conjoined with the independent assertion of the existence of any events described by the matrix VP. On the other hand, in the case of complement clauses, the event described by the complement forms an argument of the predicate described by the bridge verb. Schematically, then, we may expect to find semantic differences such as the following.

- (208) a. **Tensed adjunct clause:**  $\exists e_1.(\dots e_1 \dots) \wedge \exists e_2.(\dots e_2 \dots)$   
 b. **Tensed complement clause:**  $\exists e_1.(e_1 = P(\dots, \exists e_2.(\dots e_2 \dots)))$

While the existence of the adjunct event is clearly asserted independently of the existence of any event described by the matrix VP, then, the existence of an event described by the complement clause is not asserted independently, but is rather dependent on the predicate expressed by the matrix verb. The existential quantifier which binds the complement event variable is therefore within the scope of the quantifier which binds the matrix event variable. This is the crucial difference between the two cases in the light of the Event Structure Presupposition Hypothesis: on the one hand, a representation such as (208a) in



no way corresponds to a single event, but rather to two events which are asserted to exist independently of each other. On the other hand, a representation such as (208b) asserts the existence of only a single independent event,  $e_1$ . The second event variable,  $e_2$ , is bound within the scope of the matrix verb, however. Following Heim's (1992) semantics of attitude verbs, for example, this means that the existence of  $e_2$  in *this* world is not necessarily asserted. All we can say for sure is that the existence of  $e_2$  in some world accessible to the subject from the real world is asserted. Depending on the content of the predicate  $P$ , then, we may well have no guarantee from a representation such as (208b) that  $e_2$  actually happened.

This fact is reminiscent of the well-known phenomenon of opacity in belief contexts. To take a concrete example, (207a) cannot be paraphrased as asking the identity of the person such that there exists an event in the actual world of Mary kissing that person and there exists a separate event of John saying that the first event exists. We are not able to conclude from (207a) that that kissing event actually took place. Only the saying event is asserted to have taken place, so it would be more accurate to say that (207a) asks the identity of the person such that there exists an event of John saying that there exists an event of Mary kissing that person.

So the theory developed here allows us to distinguish between tensed adjuncts and many tensed complement clauses on the grounds that it is only in the adjunct case that the described event has the necessary independence from the matrix event to violate the Event Structure Presupposition Hypothesis. The referential opacity of bridge verbs is sufficient to block the formation of two separate event groupings, and so the Event Structure Presupposition Hypothesis can still be satisfied. The following subsection shows that, in fact, this approach can do more work in this area, by concentrating on a class of matrix predicates where this referential opacity does not hold.

### 3.3.3 Factive Islands and Event Structure

The previous subsection set up a basic distinction between tensed adjuncts, which disallow subextraction, and tensed complements, which may allow subextraction, based on the different properties of the events described by those two structures in relation to the matrix event. However, since Erteschik-Shir (1973), it has been noted that extraction from a tensed complement clause is not always possible. One of the classes of exception which

she examines are the *factive islands*, illustrated by examples such as (209).<sup>39</sup>

(209) \* Who did John regret [that Mary kissed *t*]?

As before, we have a tensed clause as the complement of the matrix verb, but the approach taken to the cases of *say* and *think* above must fail here for some reason.

The clearest difference between examples such as (209) and (207) above concerns the pragmatic status of the event described by the complement clause. The occurrence of such an event is presupposed by a verb such as *regret* (it is for this reason that they are known as *factive verbs*), but not for a verb such as *say*. This means, for example, that the case with *regret* in (210a) continues to imply that the addressee lied, despite this proposition being embedded under an interrogative operator, but this does not happen in (210b), where the matrix verb is non-factive *say*.

(210) a. Did you regret that you lied?

b. Did you say that you lied?

In a sense, then, the occurrence of the presupposed event in (210a), but not (210b), is independent of the material contained in the matrix verb, in that it is unaffected by the presence of operators such as the interrogative operator within the matrix clause. This is largely in keeping with Erteschik-Shir's original approach to these matters. Presupposition is a paradigm case of Erteschik-Shir's notion of *semantic subordination*, the opposite of *semantic dominance*. Erteschik-Shir's theory of extraction is based on the following condition.

(211) Extraction can only occur out of clauses or phrases which can be considered dominant in some context.<sup>40</sup> (Erteschik-Shir 1973:27)

<sup>39</sup>I will not discuss in any detail Erteschik-Shir's other major class of non-bridge verbs, which consists of cases where the verb incorporates a manner of saying as well as the approximate basic semantic content of *say*, as in ?? *Who did John yell/holler/whisper/exclaim that Mary kissed?*. Section 3.4.5 contains some speculative remarks on the similar behaviour of these two classes, but a coherent, unified account continues to elude me.

<sup>40</sup>The inclusion of the qualification 'in some context' is due to some rather idiosyncratic and variable data concerning verbs such as *regret*. *Regret* is now a prototypical case of a *factive island-inducing verb*, but extraction from its complement is considered acceptable by Erteschik-Shir's informant. She proposes to account for this by relating it to the fact that its complement is not presupposed in an example such as *Harvard regrets that children cannot be accommodated* (Erteschik-Shir 1973:91, attributed to Karttunen). In that case, there are contexts in which *regret*'s complement is not presupposed (or, in her terminology, is *semantically dominant*), which leads her to predict that extraction from the complement of *regret* is acceptable. As this is

What this condition does not do, however, is explain *why* presupposition should block extraction in this way. Armed with the Event Structure Presupposition Hypothesis, however, we are in a position to provide such an explanation.

The second vital ingredient in this explanation is a scope-based theory of presupposition projection. A family of theories of presupposition derive the result that a presupposed element comes to have wider scope than the same element would if asserted. For concreteness, I will illustrate with one such theory, from van der Sandt (1992). Van der Sandt shows convincingly that the semantic conditions under which presuppositions are projected are related to those in donkey-sentences under which the binding by an existential quantifier of a variable corresponding to a pronoun is possible, despite the pronoun not apparently being syntactically subordinate to the existential. The sentences in (212) all fail to presuppose that Jack has children, despite the presence of the presupposition trigger *all of Jack's children*. In the parallel syntactic environments in (213), we see the classic donkey sentences, in which a pronoun is bound by a non-c-commanding antecedent.

- (212) a. Jack has children and *all of Jack's children* are bald.  
 b. If Jack has children, then *all of Jack's children* are bald.  
 c. Either Jack has no children or *all of Jack's children* are bald.

- (213) a. John owns a donkey. He beats it.  
 b. If John owns a donkey, he beats it.  
 c. Either John does not own a donkey or he beats it. (van der Sandt 1992:343)

Building on this, van der Sandt claims that, semantically, pronouns and presuppositions are both simply anaphors, and that, moreover, they are subject to the same resolution mechanisms (where “resolution” means identification of an antecedent in the case of a pronoun, or contextual satisfaction or accommodation in the case of a presupposition). The primary difference between pronouns and presuppositions is simply that only presuppositions have

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contrary to what has become the standard view in the literature, I will ignore the ‘in some context’ in what follows, as well as many subtle further details in the characterisation of semantic dominance, and instead simply concentrate on the fact that presupposition of a constituent’s denotation is predicted to prevent extraction from that complement.

internal structure, and so a more clearly defined semantic content. This means that they are easier to accommodate if an appropriate antecedent is not already present.

Van der Sandt goes on to develop a DRT-based account of the resolution of such anaphoric dependencies.<sup>41</sup> This is based on the notion of *accessibility* given in (214–215) below.

(214) *Subordination*

A DRS  $K_i$  immediately subordinates a DRS  $K_j$  if one of the following holds:

- (i) There is a  $K_k$  such that  $K_j \rightarrow K_k \in \text{Con}(K_i)$
- (ii) There is a  $K_k$  such that  $K_i \rightarrow K_j \in \text{Con}(K_k)$
- (iii) There is a  $K_k$  such that  $K_j \vee K_k \in \text{Con}(K_i)$
- (iv) There is a  $K_k$  such that  $K_k \vee K_j \in \text{Con}(K_i)$
- (v)  $\neg K_j \in \text{Con}(K_i)$
- (vi)  $K_j \in A(K_i)$ <sup>42</sup>

A DRS  $K_i$  subordinates a DRS  $K_j$  just in case

- (i)  $K_i$  immediately subordinates  $K_j$
- (ii) There is a  $K_k$  such that  $K_i$  subordinates  $K_k$  and  $K_k$  subordinates  $K_j$

(215) *Accessibility*

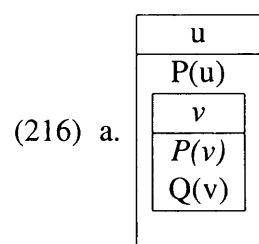
Let  $u \in U(K_j)$ , where  $K_j$  is an element of some A-structure and  $v$  an established marker in some  $U(K_i)$ . Now  $v$  is accessible to  $u$  just in case  $K_i$  subordinates  $K_j$ .  
(van der Sandt 1992:356)

<sup>41</sup>A word on the status of DRT in the analysis to be presented below: Any theory attempting to capture the claimed distributional similarity of presupposition projection and donkey anaphora will inevitably have a dynamic component, given the central status of the anaphora data in the initial development of dynamic semantic theories. However, this dynamic theory does not necessarily have to be DRT, and reformulations of van der Sandt's observation within other dynamic frameworks is, as far as I can see, feasible. Having said that, the pictorial representation of DRSs and the derivational flavour of standard DRS construction rules (for example in Kamp and Reyle 1993) make the use of DRT here convenient for expository purposes. As far as possible, I have tried to stay theory-neutral with respect to the semantic claims in this thesis, which may lead to an apparent inconsistency as I switch between the standard static semantics employed to date and the DRT used in the rest of this section. This is purely in the interests of abstracting away from relatively minor details of the formalism as far as possible and concentrating on the wider architectural claims.

<sup>42</sup>The structure  $A(K)$  is an addition made by van der Sandt to the definition of a DRS  $K$ , familiar from e.g. Kamp and Reyle (1993), as a pair  $\langle U(K), \text{Con}(K) \rangle$ , corresponding to the universe of discourse markers and the constraints upon that universe, respectively. Van der Sandt adds the *A-structure*  $A(K)$  to that pair, corresponding to a collection of the anaphoric elements (sub-DRSs) of  $K$ .

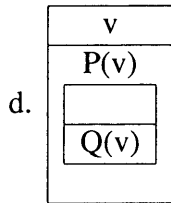
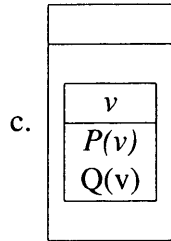
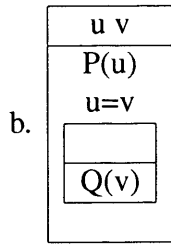
Van der Sandt is careful to distinguish his theory from one in which presuppositions are always accommodated with maximally wide scope. Instead, the definition of subordination allows one to recursively trace a path through superordinate DRSs to find an antecedent, with the presupposition generally being resolved with the most local antecedent found. If no accessible antecedent is found, the presupposition will instead be accommodated by adding the relevant information to a superordinate DRS. In this case, the preference is for *global* accommodation, in the highest DRS, corresponding to maximally wide scope, but local accommodation in a lower DRS can be forced if accommodation in the highest DRS would lead to inconsistency. However, these details are less important for our purposes than the fact that a presupposed element comes to have wider scope than a corresponding asserted element, as although van der Sandt's theory distinguishes presuppositions from elements with maximally wide scope, it nonetheless relies on the accommodation (or independent existence) of a presupposed element in an accessible, but superordinate, DRS, where accessibility is the nearest equivalent in that theory to the classical notion of wide scope. After resolution or accommodation, then, a presupposed element almost always comes to be included in a DRS with wider scope than the DRS within which the presupposition was generated.<sup>43</sup>

Pictorially, this can be represented as follows. In (216a), the embedded DRS contains a presupposition (represented in italics) which is compatible with a constraint in a superordinate DRS. The presupposition is resolved with this constraint, producing (216b). In (216c), on the other hand, there is no such accessible potential antecedent, and so the presupposition is accommodated globally, as in (216d). In both cases, the result is that the presupposition comes to be associated with a DRS which outscopes the DRS which gives rise to the presupposition, and so the verification of the presupposed constraint comes to be independent of the structure which initially generated that presupposition.




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<sup>43</sup>The exception implied by 'almost always' comes from a possible scenario in which the only site for accommodation or resolution is within the same DRS that gave rise to the presupposition. This situation is perhaps common with anaphora, but much less so with true presuppositions, and I ignore it in the following.



The interest for our purpose comes in the interaction of such a theory of presupposition with propositional attitude verbs, and factive verbs in particular. It has been well-known since Frege that attitude verbs create opacity, in the sense that properties assumed to hold of the real world cannot be assumed to hold in the belief world of the subject of an attitude verb, and *vice versa*. For example, in the real world, it is known that Elton John's real name is Reg Dwight, and so Elton John and Reg Dwight are one and the same individual. In that case, (217a) is true iff (217b) is true.

(217) a. Elton John wears a wig.

b. Reg Dwight wears a wig.

However, the actual identity of the people named by two proper names is no impediment to someone believing that the proper names pick out two different individuals. In that case, it is quite possible for someone to believe one of (217a) and (217b) to be true without believing the other. In that case, the truth conditions of (218a) and (218b) are able to vary independently of each other.

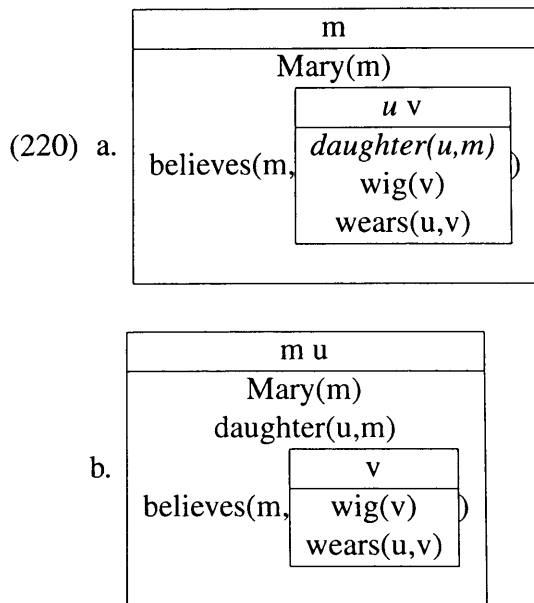
(218) a. John believes that Elton John wears a wig.

- b. John believes that Reg Dwight wears a wig.

However, one salient exception to this rule concerns presuppositions. Under normal circumstances, a sentence such as (219) presupposes both that Mary has a daughter, and that Mary believes that she has a daughter. This, then, is one case in which information embedded under a factive verb can apparently affect our assumptions about the real world, as the presupposition *Mary has a daughter* must be resolved or accommodated outside the scope of the embedded proposition.

(219) Mary believes that her daughter wears a wig.

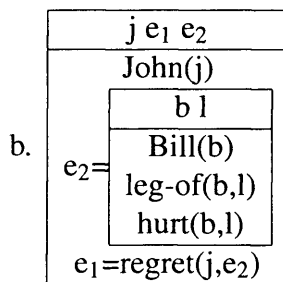
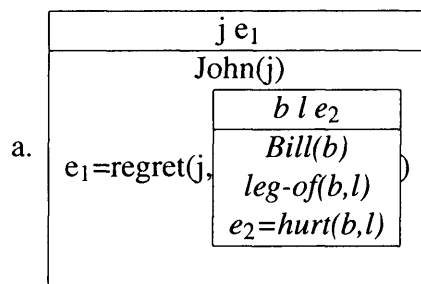
There is general agreement that there is an asymmetry between the two presuppositions, the one concerning the actual world and the one concerning the belief world, such that one of the presuppositions is in some sense derivative of the other, and so need not be generated by the theory as an independent presupposition. However, there has been some disagreement as to which presupposition should be taken as basic and which should be taken as derived. I will follow Geurts (1998), (*contra* Heim 1992) in assuming that the presupposition concerning the actual world is basic.<sup>44</sup> In that case, representations of (219), with unresolved and accommodated presuppositions respectively, can be found in (220).



<sup>44</sup>I will not repeat Geurts' very detailed discussion of the different predictions of the two theories here — see his paper for these details. Equally, I have simplified his representations in ways which are harmless to the point at issue here. For instance, the variable *u* is moved from one DRS to the other in (220) without comment. For Geurts, such a process is at the heart of a *counterpart* relation which is crucial to generating the second presupposition inside Mary's belief world. Again, I refer the reader to Geurts (1998) for details.

In this light, the distinguishing property of factive verbs is that they presuppose their complements in their entirety, whereas any presuppositions that other attitude verbs may happen to contain are triggered by some structure or lexical item internal to that complement. After resolution or accommodation of those presuppositions, this will mean that essentially the whole propositional DRS representing the complement of a factive verb will come to reside in a superordinate DRS, and so be outside the scope of the factive verb, while the DRS representing the complement of a nonfactive attitude verb will still be within the scope of that verb. We see this distinction by comparing (221), containing unresolved and resolved representations for a factive attitude structure, with (222), which does likewise for a non-factive attitude verb.<sup>45</sup>

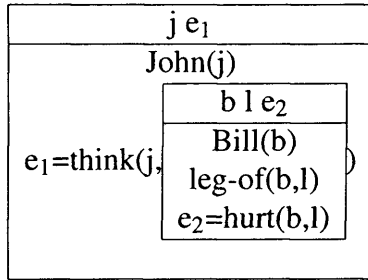
(221) John regrets that Bill hurt his leg.



<sup>45</sup>Once again, the treatment of the factive DRS contains minor inconsistencies as a result of simplification for expository purposes. The most obvious one is the rather nonstandard treatment of the internal argument of *regret*, which is represented as a DRS in one case and an event in the other. This is related to the fact that *regret* does not subcategorise for an event, but rather for a *fact*, in this case the fact that an event occurred. I abstract away from this detail for the sake of expository simplicity. Once more, though, see Geurts (1998) for a way round this, which contains rather more machinery than I want to introduce here.



(222) John thinks that Bill hurt his leg.



It is clear that a representation like (221b) includes two independent events. The condition corresponding to *Bill hurt his leg* and the condition corresponding to *John regrets e<sub>2</sub>* are separate DRS conditions introduced into the universe of discourse at the same level of embedding, which makes the former independent of the latter in the relevant respects. Moreover, the events of Bill hurting his leg and John regretting it cannot form an event grouping, in the sense defined in section 3.2.4: a more fully specified DRS would show that the event of Bill hurting his leg precedes John's regretting that event temporally, which violates one of the conditions on formation of event groupings.<sup>46</sup> I claim that, on the other hand, (222) only represents a description of a single event. The event of Bill hurting his leg has no existence independent of John's belief world in (222). In that case, it seems inaccurate to claim that there are two events in (222) — instead, we have one event which consists of John thinking that a second event exists. In that case, the Event Structure Presupposition Hypothesis, coupled with the van der Sandt/Geurts theory of presupposition projection from belief contexts, correctly predicts that factive complements are islands. To come back to the contrast between (207a), for example, and (209), we can see that if we cash out van der Sandt's results in the static terms I have used throughout the rest of this thesis, we will end up with representations like the following.

(223) a. Who did John say [that Mary kissed *t*]?

$$\lambda x. \exists e_1. (e_1 = \text{say}(j, \exists e_2. (e_2 = \text{kiss}(m, x))))$$

b. \* Who did John regret [that Mary kissed *t*]?

$$\lambda x. \exists e_1, e_2. (e_1 = \text{kiss}(m, x) \wedge e_2 = \text{regret}(j, e_1))$$

<sup>46</sup>It is unclear to me that all cases of factive islands can be ruled out on purely temporal grounds. However, I have not yet come up with a plausible case where none of the conditions on event groupings are violated, and so I have not been able to test the prediction that extraction from a factive complement should be possible in such a case.

As (223a) differs from (223b) in only asserting the existence of one event, and as the two events asserted to exist in (223b) are temporally independent, thanks to the presence of two distinct T nodes, it is clear that (223a) will straightforwardly meet the condition embodied in the Event Structure Presupposition Hypothesis, whereas (223b) will necessarily fail to meet that condition.

Moreover, it should be noted that this explanation is readily extensible to other presuppositional eventive environments. One such example would be a subcase of the observation that extraction from definite noun phrases is degraded with respect to indefinite noun phrases.<sup>47</sup> However, given that definiteness is primarily associated with individuals, not events, I will refrain from speculating too far in this direction here, as the topic is far too big to fit in this thesis.

In this subsection, we have moved beyond the cases of extraction from adjuncts discussed in the foregoing, to discuss the more central case of extraction from complements, and so allow the theory developed here to interact more generally with broader topics concerning locality. We concentrated on one promising application of the Event Structure Presupposition Hypothesis, to factive islands, and on showing how a well-motivated theory of presupposition could capture the distinction between bridge verbs and this particular class of non-bridge verbs. The following subsection moves on to discuss the relationship between the Event Structure Presupposition Hypothesis and cyclicity.

### 3.3.4 Cyclic Determination of Event Structure

This section has so far given us a principled reason why extraction is possible from some, but not all, tensed complement clauses, and why it is always impossible to extract from a tensed adjunct modifying a matrix VP. However, at present, it overgenerates in one very important sense.<sup>48</sup> Rectifying this problem will lead us to a conception of the syntax–semantics interface in which the Event Structure Presupposition Hypothesis is checked in every clause or at every movement step, rather than the possible alternative in which it is checked globally, for an entire syntactic representation or unbounded chain at once. In this way, the data discussed here constitute a further indirect argument in favour of a

<sup>47</sup>See Davies and Dubinsky (2003) for other observations on the interaction of event and argument structure with the possibility of extraction out of nominals.

<sup>48</sup>Thanks to Klaus Abels for the crucial observation which led to this section taking a very different direction from earlier drafts.

successive-cyclic approach to long-distance  $A'$ -dependencies, with a *wh*-phrase moving at least through every intermediate [Spec,C] position.

To see the problem with the theory as it stands, it is instructive to consider the shape of the current proposal. The crucial difference between those complement clauses from which extraction is possible and those where it is unacceptable concerns the presuppositional status of the event described by the embedded clause, relative to the matrix predicate. If the semantic material contained within the embedded clause is presupposed relative to the matrix predicate, then the embedded event is treated as independent of that predicate. This is what leads to a violation of the Event Structure Presupposition Hypothesis, and therefore to the unacceptability of extraction out of factive islands. If, on the other hand, the semantic material contained within the embedded clause is not presupposed, no such independence arises, and the Event Structure Presupposition Hypothesis is satisfied, as a result.

This theory does not differentiate any further regarding what that embedded material consists of, however. In the examples considered in the rest of this section, a simple clause was embedded beneath a predicate. However, exactly the same pattern would be predicted to occur regardless of the syntactic and semantic shape of the embedded proposition. If, for example, we modify the embedded clause with a tensed adjunct, a bridge verb construction will continue to describe a single event. Accordingly, extraction out of a tensed adjunct embedded beneath a bridge verb should be allowed, contrary to fact. This is exemplified in (224–225) below.<sup>49</sup>

<sup>49</sup>It seems that the events described by tensed adjuncts are presupposed with respect to the matrix VPs to which they are adjoined, given that they are unaffected by matrix negation, as shown in (i–ii).

(i) John cried after Mary kissed Bill  $\rightarrow$  Mary kissed Bill.

(ii) John didn't cry after Mary kissed Bill  $\rightarrow$  Mary kissed Bill.

However, crucially, this presupposition fails to project past a matrix bridge verb, which acts as a plug in such cases. This is shown by considering the fuller paradigm in (iii–v).

(iii) Susan said that [John cried after Mary kissed Bill]  $\nrightarrow$  Mary kissed Bill

(iv) Susan said that [John didn't cry after Mary kissed Bill]  $\nrightarrow$  Mary kissed Bill

(v) Susan didn't say that [John cried after Mary kissed Bill]  $\nrightarrow$  Mary kissed Bill

In that case, the ungrammaticality of the cases discussed in the main text remains a surprising fact.

(224) a. \* Who does Susan regret [that John cried [after Mary kissed  $t$ ]]?

b.  $\lambda x \exists e_1, e_2, e_3. (e_1 = \text{cry}(j) \wedge e_2 = \text{kiss}(m, x) \wedge \text{after}(e_1, e_2) \wedge e_3 = \text{regret}(s, e_1 \oplus e_2))$

Violates Event Structure Presupposition Hypothesis: ungrammaticality expected.

(225) a. \* Who did Susan say [that John cried [after Mary kissed  $t$ ]]?

b.  $\lambda x \exists e_1. (e_1 = \text{say}(s, \exists e_2, e_3. (e_2 = \text{cry}(j) \wedge e_3 = \text{kiss}(m, x) \wedge \text{after}(e_2, e_3))))$

Satisfies Event Structure Presupposition Hypothesis: ungrammaticality **unexpected**.

The crucial modification requires us to pay slightly closer attention to the syntax of such long-distance  $A'$ -dependencies than we have up till now. Given a regular syntactic representation of (225) as in (226), it will be clear that we have so far said nothing about the role of the intermediate trace of *who* with respect to the Event Structure Presupposition Hypothesis.<sup>50</sup>

(226) [<sub>CP</sub> Who did Susan [<sub>VP</sub> say [<sub>CP</sub>  $t_{\text{who}}$  that John [<sub>VP</sub> [<sub>VP</sub> cried] [<sub>PP</sub> after Mary [<sub>VP</sub> kissed  $t_{\text{who}}$ ]]]]]]]

In principle, there are two options with respect to the intermediate landing site and the Event Structure Presupposition Hypothesis. Either we ignore it, and check the Event Structure Presupposition Hypothesis with respect to the whole *wh*-chain, or we include it, and verify that the structure satisfies the Hypothesis at each stage of *wh*-movement. By ignoring the issue until now, we have tacitly placed ourselves in the former camp, which led to problems in accounting for the ungrammaticality of (225). However, this problem melts away if we adopt the second possibility, and check event structures cyclically for conformity with the Event Structure Presupposition Hypothesis.

Here's how this helps. Consider the embedded CP in (225), with the *wh*-phrase having moved to its specifier. As (227) shows, this structure fails to meet the Event Structure Presupposition Hypothesis.

(227) a. [<sub>CP</sub> Who that John [<sub>VP</sub> [<sub>VP</sub> cried] [<sub>PP</sub> after Mary [<sub>VP</sub> kissed  $t_{\text{who}}$ ]]]]]

b.  $\lambda x \exists e_1, e_2. (e_1 = \text{cry}(j) \wedge e_2 = \text{kiss}(m, x) \wedge \text{after}(e_1, e_2))$

Violates Event Structure Presupposition Hypothesis: ungrammaticality expected.

<sup>50</sup>I put aside the issue of whether there should also be an intermediate trace of *who* in [Spec,P], as it has no bearing on our interests here.

Assuming that the Event Structure Presupposition Hypothesis is checked cyclically therefore gives us a way of explaining the ungrammaticality of (225), while keeping all our earlier results. I therefore adopt the following, with its obvious architectural similarities to current phase-based theories (Chomsky 2000, 2001) of cyclic interpretation.

**(228) Cyclic determination of event structure**

A structure must satisfy the Event Structure Presupposition Hypothesis at every step of A'-movement.

### **3.3.5 Summary**

This section has had several related aims in its sights. We have seen how the Event Structure Presupposition Hypothesis simultaneously accounts for the impossibility of extraction out of a tensed adjunct and extraction out of the complement of a factive verb, while still allowing extraction from the complement of a bridge verb. Moreover, we have found, in our attempts to avoid potential overgeneration, an indirect argument for successive cyclic movement and a grammatical architecture in which structure is interpreted cyclically rather than globally. This section, then, has seen us move beyond the domain of extraction from adjuncts towards a general picture of the place of the Event Structure Presupposition Hypothesis in locality theory.

However, it should be clear that we cannot expect the theory developed here to capture the full range of observed locality effects, even in English. The following section has as one of its aims a description of the limits of the applicability of the semantic theory developed here. It will also, though, contain a demonstration that no syntactic theory can naturally cover the same ground of the Event Structure Presupposition Hypothesis. The result will therefore be a theory of extraction which makes maximal use of the architecture of an interface-driven theory of grammar, with narrowly syntactic conditions taking their place alongside interface-driven constraints.

## **3.4 Comparison with Syntactocentric Approaches**

If the argumentation above is on anything like the right track, it is clear that event structure, a semantic and pragmatic factor, has a significant impact on the applicability of A'-movement. At this stage, that conclusion could be implemented in one of two different

ways. It is possible, as I have been implying throughout, that event structure interacts directly with A'-movement, in that the Event Structure Presupposition Hypothesis postulates the existence of a presupposition carried by a *wh*-question concerning the event structure of that question, and that presupposition must be satisfied. However, there is another theoretical possibility, namely that the event-internal structures detailed in chapter 2 are represented in the syntax, and that the Event Structure Presupposition Hypothesis is actually derivative of a purely syntactically defined structural condition on A'-movement. Although the details of the event-internal structure proposed have changed significantly, this position has much in common with the syntactic approach to lexical decomposition pioneered by Lakoff (1970) and other generative semanticists, and later resurrected by Hale and Keyser (1993), among others.

I wish to claim that this syntactocentric view cannot be upheld. I offer two separate reasons for this. One contemplates exactly what syntax, and locality, would look like if the necessary semantic notions were directly encoded in the syntax, and finds the resulting picture drastically different to that which we may recognise from our current understanding of locality and syntactic structure. The other shows that it is not in principle possible to represent events in the syntax with the consistency necessary to formulate the rules in question syntactically.

The first half of this section is therefore dedicated to the defense of the less syntactocentric implementation of the Event Structure Presupposition Hypothesis which has been implicitly adopted in the foregoing text. However, it should hopefully be clear that many factors affecting movement are simply outside the scope of the Event Structure Presupposition Hypothesis. I have no argument for removing the whole theory of locality from syntax — only the part covered by that hypothesis. The final part of this section therefore aims to sharpen up the division between those phenomena which at least plausibly reduce to the Event Structure Presupposition Hypothesis, and those for which we must look elsewhere for an explanation.

### 3.4.1 Two Syntactocentric Theories of Event Structure

Before proceeding, we need to be clear about exactly what constitutes a syntactocentric theory of event structure. I take it for granted that the details of the internal structure of events outlined in chapter 2 are fundamentally semantic. However, the distinguishing

feature of a syntactocentric theory of event structure is that certain features of that event structure are determined by independently motivated features of phrase structure.

At this point, we reach a fork in the road. Syntactic structures, at a very abstract level, have two main components: a set of constituents, and certain specified relations among those constituents. In Chomskyan terms, those relations include the family of largely inter-definable relations such as c-command and dominance; the family of privileged relations which participate in selection or agreement, possibly including head–complement, head–head or spec–head; and the relations which link elements in a chain or other apparently nonlocal grammatical dependency. Similarly, event structure, at least on any decompositional theory, has two main components: a set of events, and certain specified relations among those events. In the theory of event structure developed in section 2, those relations include temporal and contingent relations, inclusion relations which allow us to consider a macroevent in terms of its subevents, and the relations among events which allow us to form the event groupings discussed in sections 2.6 and 3.2.4. So there are two obvious ways in which a syntactocentric theory might be developed.

(229) a. **Syntactocentric hypothesis 1:** Events always correspond to constituents at a given level of representation.

b. **Syntactocentric hypothesis 2:** Certain relations among events (e.g. contingent relations) always correspond to particular relations among constituents at a given level of representation.

In practice, however, an event is rarely considered syntactically in isolation. This causes immediate problems for the first hypothesis above. A standard theory of the interaction of phrase structure and event structure (e.g. Higginbotham 1985) holds that an event variable is usually introduced by some head, and existentially quantified by an operator associated syntactically with a second, c-commanding head. In such a case, it is not clear exactly what the event in question corresponds to syntactically, and the assertion of the existence of an event is due not to a constituent, but to the interaction of two heads which can be quite remote from each other. In its above form, then, syntactocentric hypothesis 1 appears to be a nonstarter.

A clearer, and less trivial, version of the first hypothesis above can be derived by considering the event variable's role as an argument of a predicate. In all but the simplest cases

(e.g. weather verbs), the event variable is just one of several arguments of that predicate. Call the syntactic representation of a predicate and all its arguments, eventive or otherwise, a *predicate-argument group*. We may then consider an alternative version of syntactocentric hypothesis 1, as follows:

(230) **Syntactocentric hypothesis 1 (revised)**: Predicate-argument groups are constituents at a given level of representation.

Although (230) makes no explicit reference to events, it is still at least partially a hypothesis about the representation of event structure. The other arguments of a predicate are part of the descriptive content which allows us to identify a particular event and individuate it.<sup>51</sup> Put another way, the claim behind (230) is that the assertion  $\exists e$  only becomes interesting when some further descriptive content is added to that  $e$  so that it is not trivially true. The predicate of which  $e$  is an argument, and the other arguments of that predicate, are all part of that descriptive content. Syntactocentric hypothesis 1 states that all the syntactic elements which contribute to that descriptive content form a constituent at the relevant level of representation.

Syntactocentric hypotheses 1 and 2 are in principle independent of each other. If both were true, we would in fact be proposing that there were a homomorphism from phrase structure into event structure with respect to the relations mentioned in the second hypothesis. This is a very strong position, which has never, as far as I am aware, been proposed in print. Each hypothesis has, however, been proposed in isolation. The first is explored in Geis (1973), but has been largely ignored since, and is worthy of more serious scrutiny. The second is familiar from the research programme instigated by Hale and Keyser (1993), wherein a V head taking a VP complement is interpreted as a causal relation between two events, for example. The purpose of this section is to scrutinise both these hypotheses. It will be seen that, although hypothesis 2 can be made to work reasonably well, given suitable auxiliary assumptions, for core events, the smallest level of our three-level event structure, it cannot be expanded to cover extended events or event groupings. This leaves hypothesis 1. However, this hypothesis also fails, partly because of an inadequacy with respect to the Unlikely Antilocality Puzzle presented in the introduction, and partly because it makes incorrect predictions with respect to the raising/control distinction. We will be left with the

<sup>51</sup>Note, in this respect, how we naturally talk about *the event of John kissing Mary*, specifying the participants as part of the description of the event.



conclusion that the Event Structure Presupposition Hypothesis must be a purely semantic condition, and not one dressed in syntactic clothes.

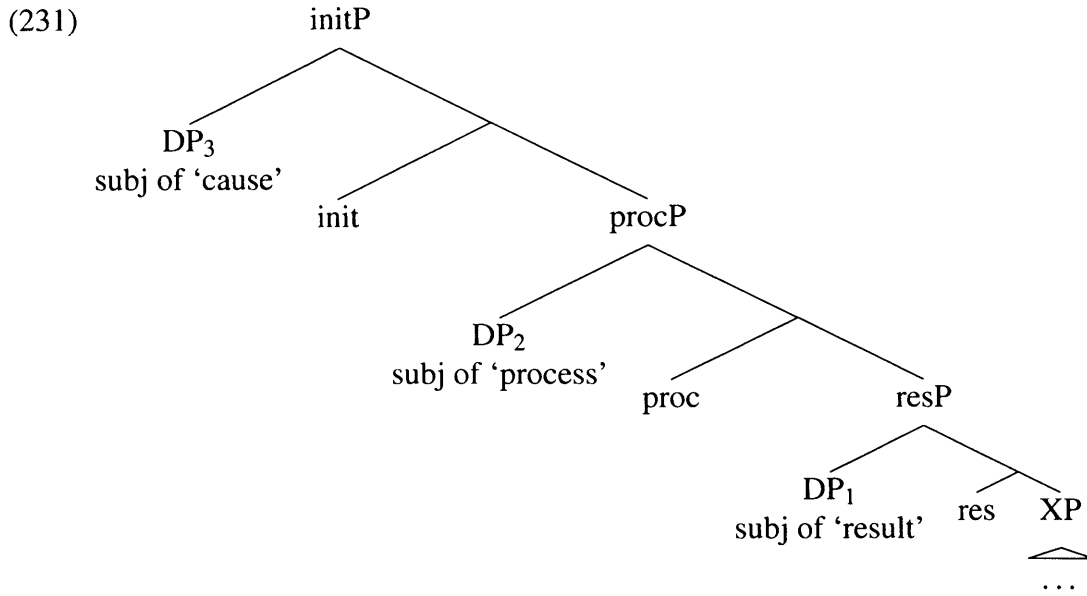
### 3.4.2 Predicate-Argument Groups as Spec-Head Relations: How Far Can We Go?

Certainly the most popular current syntactocentric theory of event structure embodies Syntactocentric hypothesis 2 described above. Hale and Keyser (1993) initiated a very productive line of research, including work by Angelika Kratzer, Lisa Travis, Liina Pykkänen, and Gillian Ramchand, among many others. The guiding hypothesis behind much of this work is that a more articulated view of event structure goes hand-in-hand with a more articulated model of the lower portion of the right-branching functional sequence that forms the backbone of the clause, or the *first phase*, to borrow Ramchand's term. Although details may vary from proposal to proposal, there is a common core consisting of the following characteristics.

If we take a restrictive version of  $\bar{X}$ -theory as a starting point, disallowing  $n$ -ary branching and multiple specifiers, then a lexical head comes with a maximum of two phrase-structural positions in which arguments could be merged, namely its specifier and its complement. For the lowest verbal head in a right-branching cascade, both of these arguments can be individual arguments. However, every other verbal head in a right-branching cascade has a verbal complement, by definition, so light verbs are restricted to a single non-verbal argument, located in its specifier. The spec-head relation may then be seen as corresponding to a generalised "subject-of" relation in the semantics. Moreover, it can be assumed that each verbal head introduces a predicate taking an event and possibly some individuals as arguments. The semantic correlate of a head-complement relation among verbal constituents is then, broadly, causation: the event described by the higher head directly causes the event described by the complement. Finally, a further relation, something like causation, except holding between an individual and an event, may hold between the highest specifier and its sister.

To take a concrete example, consider the phrase structure proposed by Ramchand (2006). Ramchand proposes that there are a maximum of three subevents in each macroevent, interpreted as cause, process, and result, respectively. Each subevent is instantiated syntactically as the head of an aspectual projection, these projections standing in complementation re-

lations with each other. If all three projections are activated in a given derivation, this leaves four empty syntactic positions in the tree, namely the specifiers of the three aspectual projections, and the complement of the most deeply embedded of the three. The first specifier positions are all filled by (not necessarily distinct) individual arguments, while the low complement position may be filled by a result-denoting XP of the sort discussed extensively by Hale and Keyser. Putting all these components together gives the syntactic structure in (231), from Ramchand (2006:32).



Interpreting this structure involves, in addition to a generalised event composition rule for specifying the relations between subevents, and a generalised ‘subject-of’ relation as described above, the lexical semantics of the individual heads, given for *res*, *proc* and *init* in (232).<sup>52</sup>

- (232) a.  $[[res]] = \lambda P \lambda x \lambda e [P(e) \& res'(e) \& State(e) \& Subject(x, e)]$
- b.  $[[proc]] = \lambda P \lambda x \lambda e \exists e_1, e_2 [P(e_2) \& proc'(e_1) \& Process(e_1) \& e = (e_1 \rightarrow e_2) \& Subject(x, e_1)]$
- c.  $[[init]] = \lambda P \lambda x \lambda e \exists e_1, e_2 [P(e_2) \& init'(e_1) \& State(e_1) \& e = e_1 \rightarrow e_2 \& Subject(x, e_1)]$  (p.38)

<sup>52</sup>In actual fact, certain heads in Ramchand’s system are associated with multiple lexical entries, the choice between them depending on the nature of their complement in a given example, but I abstract away from this complication here.

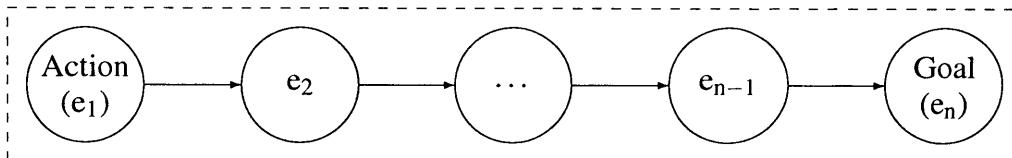
This is clearly a theory which embodies Syntactocentric hypothesis 2, in that it sees complementation as the syntactic embodiment of direct causation. It does not, however, embody Syntactocentric hypothesis 1, as a verbal head introducing a predicate of an event and an individual does not generally form a constituent with the XP denoting the individual, but rather usually stands in a Spec–head relationship with it. Moreover, although the specifics of this proposal are Ramchand’s, the overall architecture is sufficiently similar to those proposed by the aforementioned researchers for broadly similar comments to carry over to their proposals.

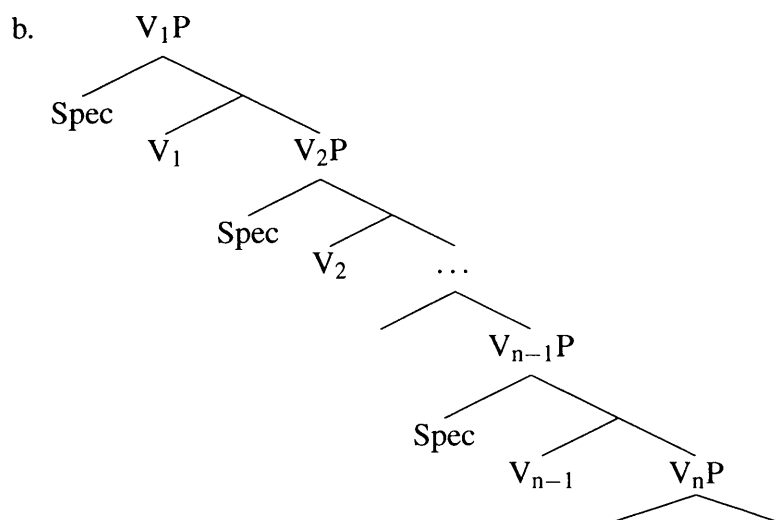
However, the empirical domain for which such theories are designed is only a small part of the much more expansive notion of event structure defended in chapter 2. The event-denoting constituents derived by a first phase syntax correspond maximally to the core events described in chapter 2, and the next subsections will demonstrate that the theory cannot be expanded to the larger structural units proposed above, namely extended events and event groupings.

### Can Syntactocentric Hypothesis 2 Cope with Extended Events?

This section will consider how we might expand a theory such as Ramchand’s to cover extended events. There is only one natural way to do this, as far as I can see, which is to further expand the right-branching cascade in the syntax, and to weaken the direct causation requirement on V-VP complementation structures, so that any contingent relation between two events is admissible as the interpretation of such a structure. This is a natural way to extend the post-Hale and Keyser theory, as complementation is the recursive structure-building operation *par excellence* in the syntax, and it is being used here to model a similarly recursive structure-building operation in the semantics, namely extended event formation. Abstracting away from specific labels, then, we may expect to see an extended event as in (233a) correspond to a right-branching cascade as in (233b).

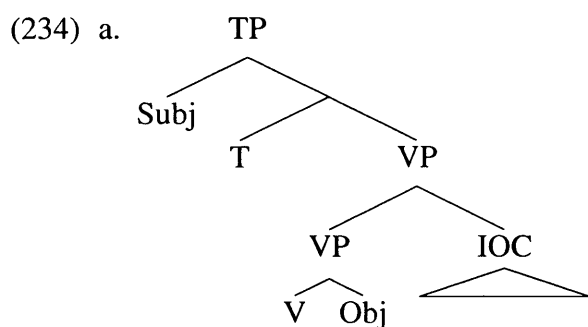
(233) a.

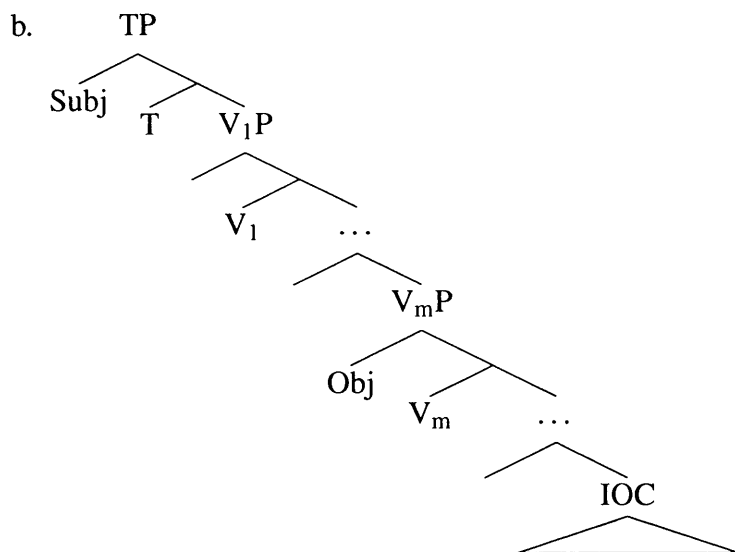




Once more, head–head relations in phrase structure correspond to contingent relations in the event structure. However, given the possibility of recursive extended event formation, the number of VP shells is no longer limited to two (Kratzer 1996, Hale and Keyser 1993) or three (Ramchand), but is in principle infinite.

However neat this generalisation may look, it runs into empirical problems almost immediately. The major problem faced by this generalisation of the post-Hale and Keyser approach to extended events comes from the fact that it predicts that elements related to initial subevents always c-command elements related to the goal with which that initial subevent was performed. Now consider one of the structures which motivated our initial discussion of extended events in section 2.5, the *in order* clause. An orthodox proposal for the syntax of such clauses (e.g. Jones 1991) would place the adjunct somewhere above, or possibly adjoined to, VP, as in (234a). However, as the *in order* clause specifies a goal of the matrix event, the theory under discussion would have to place it at the bottom of a right-branching cascade, as in (234b).





In the structure in (234a), the subject c-commands into the *in order* clause, but the object doesn't. On the other hand, in (234b), the adjunct is in a very low position at the bottom of the cascade, and so *everything* c-commands into it.<sup>53</sup> This means that if we take a traditional c-command diagnostic such as condition A, which states that a reflexive anaphor must be bound by a locally c-commanding DP, we should expect to tell the two theories apart. (235a) shows that the subject is indeed capable of binding a reflexive anaphor, as predicted by both structures. However, (235b) shows that the same is not true for the object. This strongly suggests that the object does not c-command the anaphor, and so does not c-command the *in order* clause, as in the orthodox structure, but unlike the structure developed above on the basis of Syntactocentric hypothesis 2.

(235) a. John hugged Mary [in order to make himself happier].

b. \* John hugged Mary [in order to make herself happier].

It might be objected that the antecedent of the reflexive anaphors in (236) is not the matrix subject, but a PRO contained within the adjunct. If that PRO were obligatorily controlled by the subject, then the data in (235) would be unsurprising. However, obligatory subject control in the configuration in (234b) would be quite surprising in itself, given that

<sup>53</sup>Although this is a somewhat unusual place for an adjunct to be located, it cannot be ruled out *a priori*. It can be shown that resultative secondary predicates occupy a similarly low position within the clause, for example.

this is a clear violation of the Minimal Distance Principle (Rosenbaum 1967). Again, control of PRO within the *in order* clause by the matrix *object* would be the null hypothesis in (234b).<sup>54</sup>

Exactly the same conclusion can be reached on the basis of Principle B, which states that a pronoun has to be free within a local domain. The relevant data are given in (236).

(236) a. \*John<sub>i</sub> hugged Mary [in order to make him<sub>i</sub> feel happier].

b. John hugged Mary<sub>i</sub> [in order to make her<sub>i</sub> feel happier].

Once again, such a pattern is expected given a structure like (234a), where the matrix subject, but not the matrix object, c-commands the *in order* clause. However, if we were to adopt a structure like (234b), where both arguments c-command the *in order* clause, it would not be possible to define the notion of *local domain* in such a way that it included the matrix subject but excluded the more local matrix object. Accordingly, any definition of *local domain* which excludes the matrix object, thereby explaining the absence of a Principle B violation in (236b), would also necessarily exclude the matrix subject, and so predict that Principle B was also satisfied in (236a).

Given that it gets the c-command facts, and so the constituency facts, wrong, then, it is clear that the post-Hale and Keyser implementation of Syntactocentric hypothesis 2 cannot be used as a model of the full event structure described in chapter 2. This does not preclude using it as a model of the syntactic representation of core events, as the above evidence only weighs against using it for extended events, and so, *a fortiori*, for event groupings. The next subsection will discuss the application of the post-Hale and Keyser theory to core events.

### Can Syntactocentric Hypothesis 2 Cope with Core Events?

So how well does the post-Hale and Keyser theory capture the internal structure of core events? Although there are problems here, too, in this case they are unsurprisingly more minor. I wish to concentrate in particular on the issue of event-denoting subjects. If the decompositional theory originating with Dowty (1979) is on the right track, then one clear case of a superficial syntax–semantics mismatch concerns the subject in an accomplishment sentence like (237).

<sup>54</sup>Thanks to Eric Reuland for bringing this potential objection to my attention.

(237) John deafened me.

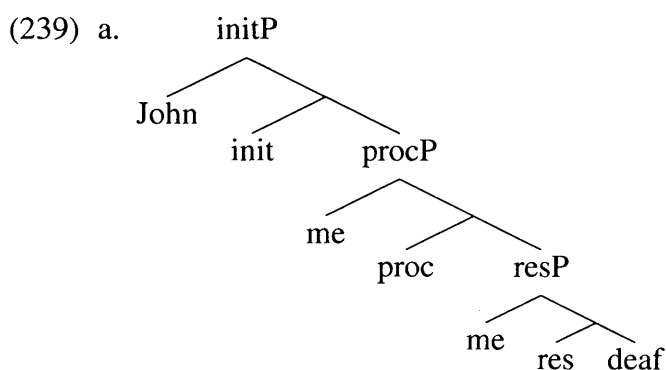
Although the subject in (237) appears to denote an individual, Dowty defines the decompositional structure of accomplishments in terms of a relation among events (more accurately, a relation among propositions, in his non-eventive framework of assumptions), such that, roughly, an event involving John caused me to become deaf. Somehow, the apparently individual-denoting subject must stand in for an event.

As it stands, the specifiers in Hale and Keyser's theory and subsequent elaborations thereof are quite removed from the core workings of event structure. Specifiers introduce individual subjects of subevents, but never contain an actual subevent-denoting constituent. At first sight, this is problematic, even beyond the specifics of the decomposition of (237), as clear cases can be found where the subject clearly denotes a causing event, rather than an individual.

(238) a. John whistling deafened me.

b. People unhappy with the choice of food ruins a dinner party.

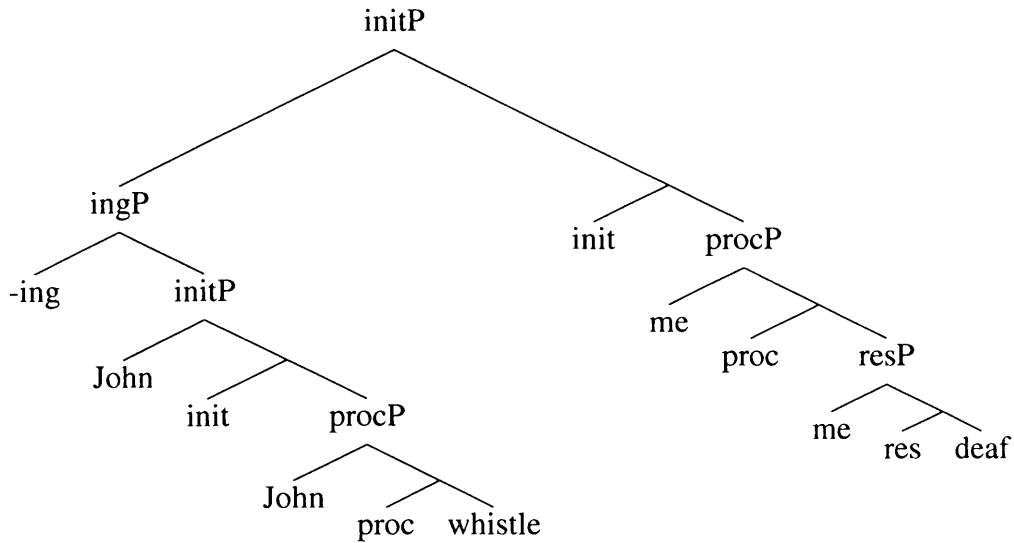
The need to allow a specifier to denote a subevent in the causal chain clearly cannot be avoided, in that case. Of course, this is not fatal to Ramchand's approach: individual- and event-denoting constituents alternate in many positions. However, this additional subevent does call into question the assumption, embodied in the post-Hale and Keyser version of Syntactocentric hypothesis 2, that complementation is the only syntactic instantiation of causation. More seriously, it may also seem that associating both specifiers and heads with distinct subevents leads to a situation where the subevent structures of (237) and (238a) are quite distinct. A representation of for (237), given a syntactic structure as in (239a), would be as in (239b).



- b.  $\exists e, e_1, e_2, e_3, e_4 [\text{deaf}(e_4) \& \text{State}(e_4) \& \text{Subject}(\text{me}, e_4) \& \text{proc}'(e_3) \& \text{Process}(e_3) \& e_2 = (e_3 \rightarrow e_4) \& \text{Subject}(\text{me}, e_3) \& \text{init}'(e_1) \& \text{State}(e_1) \& e = (e_1 \rightarrow e_2) \& \text{Subject}(j, e_1) \& \text{Past}(e)]$

Meanwhile, a representation for (238a), given a syntactic structure as in (240a), may be as in (240b):<sup>55</sup>

(240) a.



- b.  $\exists e, e_1, e_2, e_3, e_4 [\text{deaf}(e_4) \& \text{State}(e_4) \& \text{Subject}(\text{me}, e_4) \& \text{proc}'(e_3) \& \text{Process}(e_3) \& e_2 = (e_3 \rightarrow e_4) \& \text{Subject}(\text{me}, e_3) \& \text{init}'(e_1) \& \text{State}(e_1) \& e = (e_1 \rightarrow e_2) \& \text{Subject}(\iota e_7 \exists e_5, e_6 [\text{whistle}(e_6) \& \text{proc}'(e_6) \& \text{Process}(e_6) \& \text{Subject}(j, e_6) \& \text{init}'(e_5) \& e_7 = (e_5 \rightarrow e_6) \& \text{Subject}(j, e_5)], e_1) \& \text{Past}(e)]$

If we take this at face value, the subject of  $e_1$  is an individual in (239b), but an event in (240b). However, the event of John whistling in (240) *cannot* bear the same relation to the causing event  $e$  that the individual John would in (239). The main reason for this

<sup>55</sup>The assumptions made here in addition to those in Ramchand (2006) are small, and relatively inconsequential. Firstly, I assume that the last event variable introduced by the finite verb is bound by T in the way familiar in work stemming from Higginbotham (1985) and discussed in sections 2.6 and 3.3 above. Secondly, I assume that something similar (exactly what is immaterial — here I term it an  $\iota$  operator) will account for the binding of the highest event variable in the gerundive subject. Finally, I generalise the cases of multiple  $\theta$ -role assignment to a single argument from those discussed in Ramchand (2006). In each case, although the details may be incorrect, something similar must be invoked.

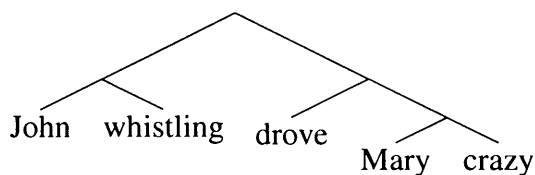
As I was preparing the final draft of this thesis, I became aware of some discrepancies between the older version of Ramchand's paper on which this discussion is based, and the most recent publicly available draft, which takes a somewhat different approach to the syntax of many accomplishments, particularly creation and consumption verbs. Although I have been unable to fully integrate this into the thesis, I believe that it would not have a significant impact on the point under discussion here, as the changes in the new draft all involve the lower structure, in *procP* and *resP*, whereas my worries concern specifically the specifier of *initP*.



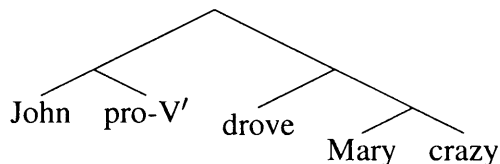
is that the object John, an identifiable, delimited lump of stuff, will not deafen anyone, or even emit a sound, except by doing something (or conceivably, having something done to it). Where is that doing something encoded syntactically in (239a)? There are two obvious candidates, namely as a property of the event introduced by either matrix *init*<sup>0</sup>, or matrix *proc*<sup>0</sup>. Neither of these can work in a strict syntax–semantics map, however: in (238a), the event-denoting subject does not need a “doing something” component in the semantics of *init*<sup>0</sup> — that component is already provided in the semantics of the subject itself. Alternatively, relegating the “doing something” component to the process head *proc*<sup>0</sup> merely shifts the problem: either the (surface) subject or the (surface) object must occupy [Spec,proc]. In (238a), allowing the surface subject to occupy it would merely replicate the problem highlighted above with respect to [Spec,init]. However, allowing the surface *object* to occupy [Spec,proc] in (238a), while the surface *subject* occupies the same position in (237), destroys the direct mapping in a different way by allowing different syntactic argument structures to map onto a semantic event and argument structure which is identical in all the relevant respects. Adding extra layers of functional structure will merely replicate these two problems.

A third possibility to rescue this proposal would work as follows. (238a) may be represented as in (241a), while (237) could be represented as in (241b).<sup>56</sup>

(241) a.

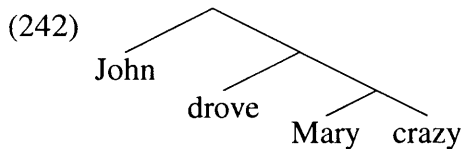


b.



<sup>56</sup>I believe, although I will not attempt a demonstration here, that the three functional heads proposed by Ramchand stem from the need to preserve empirical adequacy while conflating the different roles played by macro-events and subevents. In Ramchand's system, subevents are simply smaller, in terms of tree structure, than macro-events, in that they lack one or two layers of functional structure (Ramchand claims that *procP*, the process component, always remains). On the other hand, I am claiming that macro-events and subevents are distinguished, not necessarily by size, but certainly by the types of arguments they take and the relations among those arguments. It is this which leads to the interpretive difference between, say, a process and an accomplishment for me, whereas for Ramchand, either a process must embed a causing event or *vice versa*. And it is the need to include both cause and process within a single, general functional structure which distinguishes a proposal such as Ramchand's from less syntactically driven alternatives.

However, this implies identical c-command relations regardless of the presence or absence of the gerund. Specifically, the c-command domain of *John* is only *whistling* in (241a), and only *pro-V'* in (241b). On the other hand, a syntactically simpler theory in which the implicit “doing something” event is not represented, as in (242), predicts an asymmetry with respect to c-command between the two cases.



This means that the two theories in fact make distinct empirical predictions. And it seems that the syntactically simpler theory, in which the implicit event is simply absent from the syntax, fares better.

This is where Condition A effects come in. Condition A states that a reflexive anaphor must be bound by a local c-commanding antecedent. The importance of c-command can be seen from minimal pairs such as the following:

- (243) a. [TP John [VP loves himself]]  
 b. \* [TP<sub>[DP John's mother]</sub> [VP loves himself]]

In fact, similar contrasts are found with respect to cases such as (242). The only difference between (244a) and (244b) is that the nature of the causing event is made explicit in (244b), but not (244a). This difference, however, corresponds strikingly with a degradation in acceptability, for which Condition A, coupled with the absence of c-command, is the only obvious explanation.

- (244) a. [TP John [VP drove himself crazy].]  
 b. \* [TP[John whistling hornpipes] [VP drove himself crazy]].

However, if there were some null syntactic eventive constituent, such as *Pro-V'* in (241b), we would be at a loss to explain the distinction with respect to Condition A in (244): *John* shouldn't c-command out of the subject in either case.

For the sake of completeness, we can make exactly the same point on the basis of Condition B. Although (245a) is perhaps not perfect, it is clearly much more acceptable than (245b), where the pronoun is c-commanded by its antecedent, in violation of Condition B.

(245) a. ?[<sub>TP</sub> [John<sub>i</sub> having to whistle hornpipes] [<sub>VP</sub> drove him<sub>i</sub> crazy]].

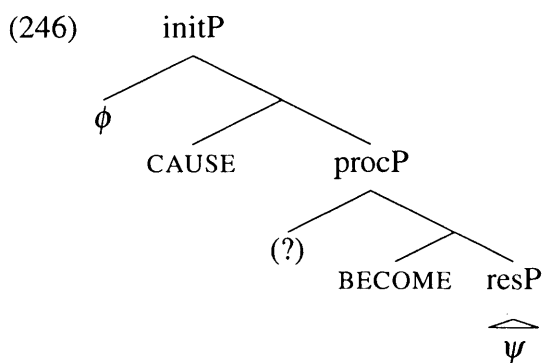
b. \* [<sub>TP</sub> John<sub>i</sub> drove him<sub>i</sub> crazy].

The natural way to account for these facts is to say that, when necessary, a constituent such as *John* can denote an event, as a form of coercion. If a predicate such as *deafen* requires an event-denoting subject for semantic coherence, then whatever constituent occupies the subject position had better be interpreted as an event. This allows us to make the necessary distinction between (244a) and (244b), as we do not need to posit any null syntactic material in (244a), so much as complicate the syntax–semantics mapping slightly.

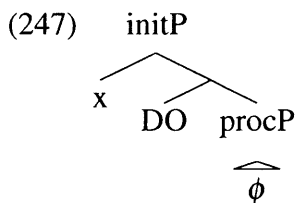
This coercion brings worries of its own, however, concerning the nature of the generalised subject-of relation implicit in Hale and Keyser (1993) and formalised by Ramchand. An event makes a natural subject of an accomplishment predicate like *deafen*, but not of an activity like *walk*, say, which would correspond to a bare procP, or possibly initP + procP, in (231). Equally, resultative small clauses (on theories which admit resultative small clauses), which, on Ramchand's theory, correspond sometimes to resP and sometimes to procP in (231), take an individual-denoting subject rather than an event-denoting subject. The subject of an accomplishment predicate is very much the odd one out, in this respect, all the more so since the highest projection in the first phase, InitP, arguably also occurs in other agentive structures such as processes. It is hard to see what the semantic content of the subject-of relation could be, if the subject of the same projection is in some cases a subevent, and in other cases an individual argument of a subevent.

I conclude, then, that a model embodying the version of Syntactocentric hypothesis 2 that states that contingent relations in semantics correspond to head–complement relations in syntax cannot be extended to cover the full range of event structures discussed in chapter 2. The model may well be adequate to cover core events, but even then, certain non-trivial questions concerning the interpretation of the generalised subject-of relation and coercion from individual to event denotations need to be addressed. Most importantly for our present purposes, we saw that it is necessary to allow a subject to denote an individual in certain cases, and an event in others, while remaining syntactically identical in terms of constituency and c-command relations. In the special case of the decompositional structure of accomplishments (although admittedly not in the case of many activities), then, adoption of Syntactocentric hypothesis 2 requires that predicate-argument groups be represented

syntactically as constituents. The constituent occupying [Spec,init] must be taken to denote a causing event, by coercion if necessary, while the result phrase denotes the result state. In this way, a full-blown instantiation of (231) is very close to a straightforward syntactic implementation of Dowty's (1979) decompositional semantics of accomplishments, according to which CAUSE relates two events (or propositions), the latter of which is of the form BECOME  $\phi$ . Only the specifier of VP does not have a straightforward Dowtyesque analogue in this revised interpretation of (231). The translation to the syntax is as follows:



In contrast, activities translate into the syntax with a straightforwardly individual-denoting highest specifier, as in (247).



I now turn to a discussion of the feasibility of a generalisation of this pattern, as described by Syntactocentric hypothesis 1 above.

### 3.4.3 Predicate-Argument Groups as Constituents: The Unlikely Antilocality Puzzle Revisited

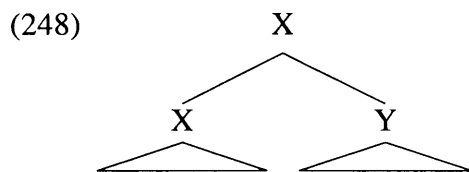
The previous subsection argued that a model of event structure which is syntactocentric in that it assumes a direct mapping between complementation relations in the syntax and contingent relations in the event semantics can only work for a very limited subset of the full event structure presented in chapter 2, requiring nontrivial assumptions even to capture the full range of core event structures. This subsection will take a different tack, and explore

the possibilities of a further form of syntactocentrism, as represented in Syntactocentric hypothesis 1, repeated below.

(230) **Syntactocentric hypothesis 1 (revised):** Predicate-argument groups are constituents at a given level of representation.

I will address the general feasibility of this hypothesis in section 3.4.4, but first of all, I want to highlight a problem specific to the implementation of the Event Structure Presupposition Hypothesis in a theory adopting Syntactocentric hypothesis 1. In this section as a whole, I hope to show that the Event Structure Presupposition Hypothesis must be cashed out in genuinely semantic and pragmatic terms, and cannot be a semantic reflection of a syntactic generalisation. Syntactocentric hypothesis 1 is interesting in this respect, because relating event-structural predicate-argument groups to syntactic constituents gives rise to a natural way of attempting to implement the Event Structure Presupposition Hypothesis syntactically, and it is important to be clear about where this fails.

What I have in mind is that treating predicate-argument groups as directly derived from particular constituents raises the possibility that certain such constituents may be islands, whereas others may fail to be. For concreteness, let us assume with Uriagereka (1999), Johnson (2002), Sabel (2002), Zwart (2007) and Müller (2007) that in a configuration such as (248), where two sisters are both phrasal, the nonprojecting sister (Y in (248)) is generally an island for extraction.



Moreover, assume that the islandhood of Y in (248) can be voided in certain circumstances, when some further syntactic relation (call it the *pseudoargument* relation) holds between (the head of) X and Y. Such a principle would certainly not be without precedent in the Chomskyan literature. For example, Huang (1982) allows extraction only from properly governed constituents, where *proper government* is equivalent to government, plus coindexation with a lexical category. A similar move is made in Chomsky (1986), when L-marking ( $\theta$ -government by a lexical category) removes barrierhood and allows movement.

Exactly how all these concepts are defined is beside the point here. What is important is to see the recurring theme of some additional syntactic relation removing a barrier to movement. The extra, pseudoargument relation here could be envisaged perhaps as an agreement relation holding between X and Y for some LF-interpretable feature, for example, which has the effect of voiding the barrierhood of Y. This appears to be a natural syntactocentric way to approach the adjunct extraction data described in section 3.2: adjuncts are naturally barriers to extraction, but this can be voided in appropriate circumstances by forming a pseudoargument relation with (the head of) their sister.

However, there seems to be little to be gained by syntacticising my theory in this way. I continue to take it for granted that the patterns of extraction described in section 3.2 have their roots in event semantics. All else being equal, then, the simplest theory of this aspect of locality makes reference exclusively to semantic factors, and the burden of proof therefore lies with any proponents of a syntactocentric version of the theory. Mimicking these factors by means of syntactic features and relations is a theoretical possibility, but we would expect the resulting syntactic theory to bear the hallmarks of syntactic phenomena. This, however, is simply not what we find.

Moreover, the Unlikely Antilocality Puzzle described in the introduction rears its ugly head again here. This puzzle was concerned with the contrast in acceptability between sentences such as the following.

- (14) a. ?? What did John drive Mary crazy [fixing *t*]?  
       b. What did John drive Mary crazy [trying [to fix *t*]]?

We concluded in the introduction that this contrast could not plausibly be explained by an antilocality condition, in the sense of Abels (2003) and Grohmann (2003). Moreover, it should be obvious how the Event Structure Presupposition Hypothesis can straightforwardly account for the contrast. *Fix* describes an accomplishment, whereas *try to fix* forms an atelic activity from that accomplishment, as shown by the following tests introduced in section 2.3. Both *fix* and *try to fix* are acceptable in the progressive, but *fix* takes *in*-PPs, while *try to fix* takes *for*-PPs.

- (249) a. John is fixing the car.  
       b. John is trying to fix the car.

- (250) a. John fixed the car in two hours.
- b. # John fixed the car for two hours.
- c. # John [tried to fix the car] in two hours.<sup>57</sup>
- d. John tried to fix the car for two hours.

Now, we saw in section 3.2.4 that bare present participial adjuncts must describe activities for extraction to be possible. This is instantly congruent with (14b), but (14a) requires a degree of coercion for extraction to be possible, which leads to a degradation in acceptability.

The question we must ask here is, how could the locality theory just sketched, based on the syntactic, barrierhood-voiding pseudoargument relation, account for the contrast? Clearly, the VP *fix* is naturally a barrier, given the unacceptability of (14a).<sup>58</sup> Something must void the barrierhood of [<sub>VP</sub> *fix*] in (14b), then.

The natural candidate is the VP's sister, *to*. Let's assume that *to* can somehow form a relation with its sister which voids its barrierhood. Then the contrast between (14b) and an example like (16), repeated below, would suggest that the barrierhood sometimes re-emerges higher within such an adjunct. According to the locality theory sketched above, both adjuncts are in position of Y in (248), and so will be barriers unless their sister VP, or its V head, enters into a pseudoargumental relation with the adjunct. We would have to claim that this happens in the case of (14b), but not (16).

- (16) \* What did John drive Mary crazy [beginning [to fix *t*]]?

Although nothing in principle blocks this chain of reasoning, it is quite at odds with standard, constituency-based approaches to syntax. This approach would make *to* a type of element which I will call a *facilitator*, the opposite of an intervener. Whereas the presence of an intervener on a movement path makes that movement harder, the presence of *to* makes movement easier. However, no current theory of locality includes a class of facilitators.

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<sup>57</sup>The brackets are intended to block the other, grammatical, reading, where *in two hours* modifies the embedded, accomplishment-denoting, clause.

<sup>58</sup>It may be objected that (14a) only shows the barrierhood of *fixing*, not *fix*. As *-ing* clearly does not form a barrier in cases such as (14b), though, it is natural to suspect that the reason for the degradation of (14a) is due to *fix* itself, and not *fixing*.

At least since Ross, the assumption has been that, in the vast majority of cases, extra syntactic material intervening between the head and the foot of the chain can only make extraction harder, never easier. This can be seen in four examples of prominent theories of locality from different stages in the development of Chomsky's program. Starting with Ross, the *variables* in the title of his thesis, *Constraints on Variables in Syntax*, refers to variables in the structural descriptions over which transformations operate. These variables were instantiated in any concrete example by a string of zero or more constituents. Ross' constraints were universally of the form 'a variable *must not* contain X', where X was some syntactic description. No constraint was of the form 'a variable *must* contain X'. Of course, additional syntactic material is only going to make it more likely that a prohibition such as one of Ross' constraints is violated.

The same is true in the Barriers theory of Chomsky (1986). The central idea of this theory is that movement is possible in the general case, but that barriers may intervene to either degrade or block movement, where those barriers are defined by relations among nodes in syntactic trees. Obviously, the greater the distance between links in a movement chain, the greater the chance that barriers intervene to block movement.

Exactly the same argument can be made with respect to two more recent theories of locality, namely Relativized Minimality (Rizzi 1990) and the emergent phase theory initiated by Chomsky (2000). In both cases, locality phenomena are accounted for in terms of a particular construct defined in very local structural terms. For Rizzi, this is intervening constituents of, loosely speaking, the same type as the displaced element. For Chomsky, the presence of a phase head eventually renders the complement of that head inaccessible to further syntactic operations.

The point of this digression is not to suggest that any of the above theories would allow or block extraction as in (14–16). In actual fact, it is not immediately clear what any of these theories predict with respect to such examples. However, it is inconceivable that such theories could permit extraction from (14b) while blocking it from (14a). As the structures contained in (14a) are a proper subset of those contained in (14b), no such conventionally defined structural element will be able to block extraction in (14a) only — it should block extraction as well in (14b) as well by definition. Yet this is exactly the pattern that we would have to claim, if our pseudoargument-based locality theory were to account for the contrasts between (14a), (14b) and (16). And worse still, we still don't have any hint as



to the reason for the distribution of pseudoargument relations. Certainly, there is nothing in the *syntax* of *try* and *begin* which suggests that one, but not the other, should enter into pseudoargument relations across adjunct boundaries. However, it should be clear that there *is* a semantic, event-structural distinction between the two. Specifically, *try* produces unbounded activities regardless of the aspectual class of its complement TP. On the other hand, *begin* is bounded. It clearly makes reference to an inception, but it is arguably also telic. At least, with respect to the *for/in* test, it patterns most like the class of points in disallowing either class of PPs, as shown below.<sup>59</sup>

(251) a. \* John hiccupped for five minutes.

b. \* John hiccupped in five minutes.

(252) a. \* John [began to fix the TV] for five minutes.

b. \* John [began to fix the TV] in five minutes.

Regardless of whether *begin* forms a natural aspectual class with points, however, it is clear that it does not form a natural class with *try* in this respect, as we saw above that *try* allows modification by *for*-PPs. It seems, once again, that the distribution of pseudoargument relations is mimicking a primarily semantic fact: syntactic pseudoargument relations are simply found wherever semantic macroevent formation is found. This may, of course, be a formal possibility, but surely a generalisation is being missed here. The real factor determining the acceptability of (14b) in comparison to (14a) or (16) is semantic, and while it is indeed within the scope of our grammatical formalism to allow a syntactic encoding of that semantic fact, that syntactic encoding would lack any independent justification whatsoever. Moreover, the extension to complement clauses presented in section 3.3 would be potentially problematic here, because complementation structures are, by definition, not of the same type as the structure in (248, as one of the sisters in a complementation is not phrasal. The pseudoargument-based approach would therefore only readily cover a proper subset of the empirical ground covered by the event-based approach.

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<sup>59</sup>*Begin* does quite easily allow progressives, unlike points, however. I suggest that this might be less of a contrast than is apparent, though. Classical points, such as *hiccup*, are most readily conceived of as atomic actions. However, if watched in slow motion on a video, it is quite possible to say *John is hiccupping* during a drawn-out hiccupping event.

It would be natural to conclude that the only reason for adopting such an approach to these data would be to preserve a particular notion of modularity, whereby locality is syntax's domain, by definition. However, two objections can be raised against this. The first is that, if such a large chunk of the semantics could be foreshadowed in the syntax without any independent motivation, then strong hypotheses about the modular architecture of the grammar would clearly lose much of their empirical bite. Secondly, though, it is a mistake to think that there is any conflict between the theory based on the Event Structure Presupposition Hypothesis and, say, an architectural model of the language faculty based on the Y-model. As was made clear in section 3.1.1, we have arrived at a model of the extraction data presented here where what is at issue is the *interpretation* of a *wh*-question, rather than locality in the traditional sense. The syntax overgenerates, then, producing many degraded questions, as well as many legitimate ones. However, as well as the well-studied constraints on their syntactic shape, the claim here is that there is a significant constraint on their *semantic* shape, as embodied in the Event Structure Presupposition Hypothesis. Degraded questions such as (14a) or (16) are not so much ungrammatical, as semantically ill-formed, and so only interpretable with significant difficulty. As mentioned in section 3.1.1, the claim here is that a question such as *Which book did John collapse after reading?* has much the same status as *Colourless green ideas sleep furiously*: both are grammatical, but in neither case is the interpretation straightforward.

Summing up, the model of locality based on a syntactic “pseudoargument” relation is theoretically possible, but the unmotivated transplantation of obviously semantic notions into the syntax must raise eyebrows, and lead to a charge that the model is being complicated, rather than simplified, overall. Moreover, there are no broad architectural reasons to follow such a path, and we would run into empirical difficulties in accounting for data such as the Unlikely Antilocality Puzzle and patterns of extraction from complement clauses.

Perversely, the lack of support for the pseudoargument-based approach to the Unlikely Antilocality Puzzle will turn out to be a relief of sorts, because I will now turn to showing that one of the tenets on which that approach was founded, namely Syntactocentric hypothesis 1, that predicate-argument groups are constituents, cannot be maintained.

### 3.4.4 Predicate-Argument Groups Need Not Be Formed from Constituents

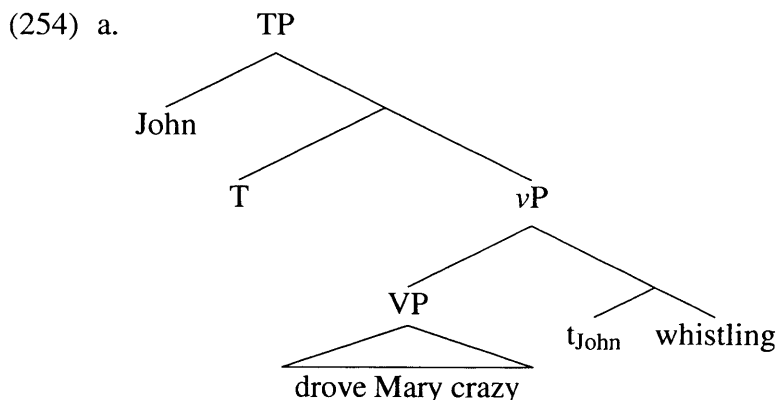
The previous subsection gave an argument against accounting for the extraction patterns detailed above in terms of a purely syntactic locality condition founded upon Syntactocentric hypothesis 1. In this section, I want to go one step further, and show that predicate-argument groups cannot be related to constituents in every case, in direct contradiction to Syntactocentric hypothesis 1. To make this argument, I will assume that the basic event structures of (253a) and (253b) are the same, as in (253c).

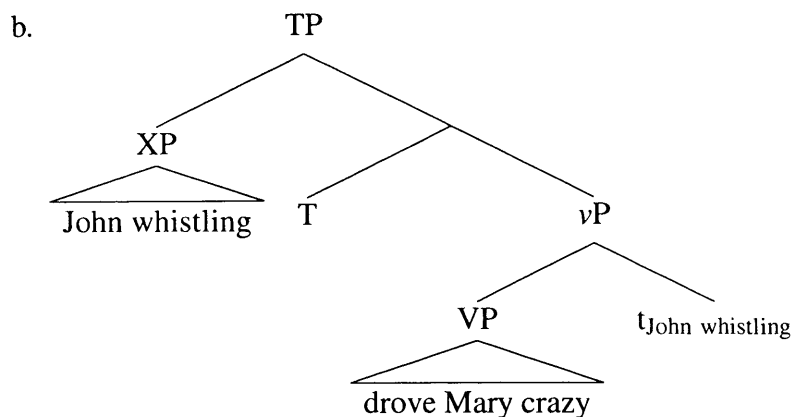
(253) a. John drove Mary crazy whistling.

b. John whistling drove Mary crazy.

c.  $\exists E, e_1, e_2. (e_1 = \text{whistle}(j) \wedge e_2 = \text{crazy}(m) \wedge E = e_1 \text{ CAUSE } e_2)$

In that case, Syntactocentric hypothesis 1 would insist that *John* and *whistling*, as a predicate-argument group, form a constituent at the appropriate stage in the derivation, in (253a) as well as (253b). That appropriate stage may be first Merge, or LF, but in either case, this would strongly suggest that *John whistling* is initially merged as a constituent in (253a) as well as (253b): in that way, it would also be natural to claim that it formed a constituent at LF through interpretation of the lower copy for the relevant properties. (253a) would then presumably be derived from raising of *John* from within the adjunct for EPP-satisfaction purposes, and (253b), by raising of the whole adjunct, as in (254).





This is, at least on the face of it, a plausible suggestion. There are two immediate objections, but neither holds much water. Firstly, A-movement out of adjuncts is hardly well-motivated, but we have already seen that such adjuncts are not islands for A'-movement of noun phrases, so there is little reason to suspect that they should be islands for A-movement. Secondly, the variable size of the raised constituent in (254) suggests a degree of optionality which is antiminimalist in spirit. However, this is exactly the same sort of optionality we find with pied piping in A'-constructions in English, so again, there are no immediate grounds to rule it out.

However, there is evidence that this proposal is not accurate. The outline of the argument is as follows. The A-movement of the subject in (254a) makes that structure a kind of raising construction, whereas more traditional approaches to such adjuncts assume that the subject of the adjunct predicate is determined by control. Raising and control structures are distinguished by, at the very least, differences in thematic relations. These differences make predictions concerning the possible subjects of the two types of structures, and the types of syntactic context in which they can appear. In any syntactic context where a control structure is grammatical, but a raising structure is ungrammatical, bare present participial adjuncts pattern with control in allowing this configuration. On the other hand, if only a raising structure is grammatical in a certain configuration, bare present participial adjuncts *disallow* it.

To illustrate this, I will first present three tests which distinguish raising and control environments in that control constructions pass the tests, while raising constructions fail them. The tests, a subset of the agentivity tests used by Dowty (1979), are intended to diagnose the presence of an external DP argument. While they are not, then, actually diagnostics of a control construction, the presence of an external argument is sufficient to rule out the

structure proposed in (254a).<sup>60</sup>

In fact, once it is shown that bare present participial adjuncts are compatible with non-derived subjects, we are, in essence, dealing with a control construction, on the most minimal assumptions about what such constructions involve. A non-derived subject is necessarily  $\theta$ -marked by the matrix verb. Furthermore, the subject in these cases is also associated with the subject  $\theta$ -role of the adjunct predicate. If we take the hallmark of control to be that one nominal is associated with two thematic roles,<sup>61</sup> then this is exactly what we find in the case of transparent secondary predicates, if the structure in (254a) can be excluded.

**Instrumental Phrases** Instrumental phrases are known (see, for example, Levin 1979) to require an animate argument to manipulate them. As this manipulation is goal-oriented, in the sense that the agent brings about some result state through it or comes to perform some activity through it, it is natural to assume that an external argument is a prerequisite for use of an instrumental phrase. A quick consideration of some typical derived subject environments supports this assumption:

(255) a. **Raising verbs:** \* John [seemed to be working] with a shovel and Bill did so with a laptop.<sup>62</sup>

b. **Passives:** ✗ John [was attacked] with an offensive banner.<sup>63</sup>

c. **Unaccusatives:** ✗ John arrived with a GPS system.<sup>64</sup>

On the other hand, environments with canonical external arguments all allow instrumental PPs, including the crucial case of obligatory control by a subject into a complement clause:

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<sup>60</sup>Of course, bare present participial adjunct constructions built around unaccusative verbs such as *arrive* will still fail these tests, as the subject is derived regardless of the presence of the adjunct. For this reason, I concentrate on the other examples here, and assume that, in the absence of evidence to the contrary, the same conclusions will carry across to the unaccusative cases.

<sup>61</sup>Whether or not this is mediated by PRO is tangential to this point. Equally, this distinction is fully compatible with the attempt to reduce control to movement in Hornstein (1999), as Hornstein characterises control as movement into a  $\theta$ -position, so that the DP comes to bear a second  $\theta$ -role.

<sup>62</sup>This example uses *do so*-ellipsis to exclude the reading where the instrumentals have embedded scope (that is, they modify *be working*, not *seem*).

<sup>63</sup>This sentence is, of course, grammatical if the implicit agent manipulates the offensive banner with the aim of attacking John. What it *cannot* mean, however, is that John wielded the offensive banner as a means of getting himself attacked.

<sup>64</sup>Again, there is an irrelevantly grammatical interpretation of this structure, where *with* is used in its “accompaniment” sense, rather than as the preposition which introduces instrumental phrases.

- (256) a. **Accomplishments:** John built a house with bricks and mortar.
- b. **Activities:** John walks around with a walking stick.
- c. **Subject control:** John [tried to repel the invaders] with a cannon and Bill [did] with sticks.<sup>65</sup>

Crucially, then, the availability of instrumental PPs with bare present participial adjuncts means that such constructions pattern with other cases with non-derived subjects. (257) is a case in point: the combination of a bare present participial adjunct with an instrumental PP is fully acceptable.

(257) John cut himself with a rusty knife carving the turkey.

**Object Control Complements** Object control verbs such as *persuade* and *convince* are another test used to distinguish base-generated subjects from derived subjects. The thinking behind the test is that if X persuades Y to do Z, it must be within Y's capacity both to do Z and not to do Z. This means that Y, in doing Z, is acting deliberately, or responsible for doing Z, properties that are taken to be characteristic of agentivity. Once again, then, Y is taken to bear an external argument role with respect to Z. Again, consideration of canonical constructions with base-generated subjects suggests that this is accurate.

- (258) a. **Accomplishments:** Bill persuaded John to build a house.
- b. **Activities:** Bill persuaded John to walk endlessly up and down Oxford Street.
- c. **Subject control:** Bill persuaded John to try to cross the Channel.

Consideration of the typical derived subject environments shows, however, that care must be taken when applying this test. At first glance, everything is as expected, as (259) shows.

- (259) a. **Raising verbs:** ?Bill persuaded John to seem to be working.<sup>66</sup>

<sup>65</sup>Note that, in contrast to (255a), ellipsis of the matrix VP here does not result in ungrammaticality, showing that matrix scope for the instrumental is available here.

<sup>66</sup>I believe that the marginal acceptability of this example can be explained in terms of the following discussion.

b. **Passives:** \* Bill persuaded John to be attacked.

c. **Unaccusatives:** \* Bill persuaded John to arrive.

However, examples with further structure in the complement clause give apparent counterexamples to this generalisation. One such set of examples includes the following:

(260) a. Bill persuaded John to arrive on time.

b. Bill persuaded John to be examined at 3:30pm.

Such examples seem only to be acceptable when the content of the main verb, the arrival or the examination, can be taken for granted. It seems that derived subjects can, in fact, pass this test if the content of the matrix VP, over which they don't have control, crudely speaking, can be taken as given, and the content of the adjunct predicate is something over which the subject *does* have some degree of control. That is, I claim that examples such as (260) must be interpreted in the following way:

(261) a. *Given that he was going to arrive at some point anyway*, Bill persuaded John to arrive on time.

b. *Given that John was going to be examined at some point that day*, Bill persuaded John to be examined at 3:30pm.

This is in contrast to an example with a base-generated subject, where further structure can readily be interpreted without such an effect.

(262) Bill persuaded John to cook lunch one day that week.  $\neq$  *Given that John was going to cook lunch at some point anyway*, Bill persuaded John to cook lunch one day that week.

Appearing in the complement of *persuade* is only, then, a test for a base-generated subject if such presuppositions can be controlled for. Even if this is controlled for, however, bare present participial adjunct constructions pattern with other constructions with base-generated subjects. In (263), I have given just enough context to make the sentence plausible, but crucially, neither John's cutting himself nor John's carving the turkey needs to be presupposed for the sentence to be grammatical.

(263) Christmas dinner was always dull in John's house, and Bill thought it should be livened up with a bit of drama. So Bill persuaded John to cut himself carving the turkey.

Moreover, in such circumstances, it is quite legitimate to extract out of the adjunct, as in (264), confirming that this is indeed a single-event structure of the relevant type.<sup>67</sup>

(264) What did John persuade Bill to cut himself [carving *t*]?

Once again, then, bare present participial adjuncts pattern with control, rather than raising constructions.

**Agent-Oriented Adverbs** The test involving the class of *agent-oriented* adverbs, such as *carefully*, involves a similar rationale, and requires similar sensitivity to presuppositions of givenness, as the previous test. The reasoning is that, if one can perform an action carefully, one must be acting deliberately in performing that action, which, again, is a property associated with external arguments. Once more, we find that constructions with base-generated subjects pass the test, while constructions with derived subjects fail the test.

(265) a. **Accomplishments:** John carefully drew a perfect circle.

b. **Activities:** John walked carefully up and down Oxford Street.

c. **Subject control:** John ruthlessly tried to humiliate every one of his students.

(266) a. **Raising verbs:** \* John carefully seemed to be working.

b. **Passives:** \* John (carefully) was (carefully) attacked.<sup>68</sup>

c. **Unaccusatives:** \* John carefully arrived.

<sup>67</sup>Curiously, extraction is not possible from all of the extractions discussed in this section. For example, there is no grammatical counterpart of (257) with extraction out of the adjunct, as shown by (i).

(i) \*What did John cut himself with a rusty knife [carving *t*]?

I have nothing to offer concerning the nature of the extra factor behind the ungrammaticality of this case.

<sup>68</sup>Again, some such sentences may be irrelevantly acceptable with the adverb predicated of the implicit agent.



Again, however, we need to control presuppositions as with the *persuade* case. (267) shows that, as in the previous case, the right presuppositions can rescue an otherwise ungrammatical structure.

(267) a. \* John carefully arrived.

b. John carefully arrived just as everyone was leaving.

(267b) is only felicitous if John's arrival is taken for granted, with the time of his arrival being something that he can control. With this qualification in mind, we once again find that bare present participial adjuncts pattern with other constructions with base-generated subjects.

(268) John deliberately cut himself carving the turkey.

Moreover, we can once again combine this test with extraction out of an adjunct, to show that we are indeed diagnosing a non-raising, single-event structure.<sup>69</sup>

(269) What did John deliberately cut himself [carving *t*]?

We have seen three ways in which subjects in bare present participial adjunct constructions pattern like base-generated, as opposed to raising, subjects. I will now take the opposite tack, and show how bare present participial adjunct structures *fail* tests designed to diagnose the presence of a raising subject. The two tests to be presented both rely on the same logic.<sup>70</sup> One major difference between control and raising, ignoring for now the VP-internal subject hypothesis, is that in the former, but not the latter, the overt subject is in a  $\theta$ -position. This means that the overt subject in a control construction must be capable of bearing a  $\theta$ -role, whereas this is not necessary in a raising construction. This means that non-thematic subjects are possible in raising, but not control, constructions. If we were to attempt to maintain the raising analysis sketched in (254a), such independent empirical evidence for the raising construction would be advantageous. However, the following two tests show that bare present participial adjuncts always disallow both subjects which are part of idiom chunks, and expletive subjects, the two classic cases of non-thematic subjects.

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<sup>69</sup>Borgonovo and Neeleman (2000:216) report a reviewer's judgements, which give an example like (269) as ungrammatical if it contains the adverb *intentionally*, but grammatical if it contains the adverb *unintentionally*. Although this contrast would be very interesting in the light of the role of agentivity in the theory developed here, I personally do not detect a contrast between the examples containing these adverbs, and I have been unable to replicate the reviewer's judgements with any of my informants.

<sup>70</sup>My source for these tests is Landau (2003), who, in turn, cites Rosenbaum.

**Idiom Chunks** The evidence from idiom chunks is not the most conclusive, as idiomatic expressions including the subject are relatively rare, and all the more so when one takes into account the aspectual restrictions on bare present participial adjuncts. The following, however, is one possible idiom with respect to which the predictions outlined above may be testable, with the meaning *house prices were falling dramatically*.<sup>71</sup>

(270) The bottom was falling out of the housing market.

It is clear that raising *the bottom* out of a bare present participial adjunct to matrix subject position is impossible.

(271) \*The bottom bankrupted Mary falling out of the housing market.

Idiom chunks, then, provide slight circumstantial evidence that the subjects of secondary predicates are not raising subjects. The following section shows that the evidence from expletive subjects is much stronger.

**Expletive Subjects** I will demonstrate below that bare present participial adjuncts do not allow either of the two expletive subjects, *there* or *it*. Turning first to *there*, (272) shows a relevant example.

(272) \*There caused a commotion sitting on the throne an angry dissident.

The ungrammaticality of (272) cannot be due to the expletive–associate relation, as (273) shows that this relation is well-formed in other environments. Furthermore, (274) shows that *cause a commotion sitting on* is an acceptable combination of matrix predicate and bare present participial adjunct in other cases. It seems reasonable, therefore, to attribute the ungrammaticality of (272) to the presence of an expletive subject with a bare present participial adjunct.

(273) There was sitting on the throne an angry dissident.

(274) What did John cause a commotion [sitting on *t*]?

<sup>71</sup>Even in this case, one might object that the use of the progressive does not indicate a truly atelic event, so much as the kind of prospective reading, discussed in section 2.5, found in uses of the progressive in achievements: *I am reaching the top right now* in actual fact means something very much like *I will very shortly reach the top*.

The same is true with expletive *it*, as shown in (275).

(275) \*It caused a commotion seeming that the dissident burnt a union jack.

Once more, neither the expletive subject on its own, nor the combination of matrix predicate and bare present participial adjunct, can be held responsible for the ungrammaticality of (275), as (276–277) show. It once again seems, then, that it is the expletive subject in the secondary predicate which causes ungrammaticality.

(276) It seemed that the dissident burnt a union jack.

(277) What did the dissident cause a commotion [(by) burning *t*]?

For completeness, (278) shows that “weather *it*” also patterns like an expletive subject in this respect, despite the “quasi-argumental” properties often attributed to this subject. Once more, (279–280) show that neither the expletive, nor the combination of predicates, is sufficient on its own to result in ungrammaticality. Instead, the most natural conclusion is that the expletive subject with a bare present participial adjunct leads to the ungrammaticality.

(278) ??It upset us raining constantly for weeks.

(279) It rained constantly for weeks.

(280) What did John upset you [trying to prove *t*]?

The evidence strongly indicates, then, that bare present participial adjuncts are a case of adjunct control, and that this must be distinguished from raising. If we buy the assumption that (253a) and (253b) have identical event structures, though, that leaves no way for us to implement Syntactocentric hypothesis 1: predicate-argument groups cannot always be treated as related to a single constituent.<sup>72</sup>

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<sup>72</sup>Actually, this is not quite true. We can maintain Syntactocentric hypothesis 1 by including a PRO subject within the adjunct, as is natural given the evidence that these are adjunct control structures. However, this raises the question of the status of the matrix subject with respect to the  $\theta$ -criterion in an example such as *John drove Mary crazy PRO whistling*. By hypothesis, the cause of Mary’s craziness is not the individual John *per se*, but the event of John whistling. In that case, the DP *John* would not be associated with a  $\theta$ -role from either predicate, as the external  $\theta$ -role of *drive Mary crazy* is assigned to PRO *whistling*, and the external  $\theta$ -role of *whistling* is assigned to PRO.

Several approaches to this problem suggest themselves. On the one hand, we could suggest, following Guéron (2005), that  $\theta$ -roles are composite notions, assigned partly within vP and partly within CP. Being

By now, we have shown that the notion of event structure which we developed in chapter 2 must be largely independent of syntax. On the one hand, the major groupings in event structure, namely events, are not always directly related to the major groupings in phrase structure, namely constituents. Equally, it is only plausible that the major relations among events, the contingent relations, are dependent on any of the major relations among constituents in the case of core events, and not of extended events or event groupings. In fact, even in the case of core events, there are many nontrivial questions which remain to be addressed. At this point, we can conclude that the Event Structure Presupposition Hypothesis does real work in delimiting the set of acceptable *wh*-questions in English, and that it is a genuinely semantic and pragmatic condition, rather than a syntactic condition with semantic reflexes.

### 3.4.5 The Limits of the Event Structure Presupposition Hypothesis

At this point, the major points of the thesis have all been made. However, it would be useful, now that our theory has a second potential source of deviance in *wh*-questions, namely ill-formedness at an event-structural as well as a phrase-structural level, to attempt to draw the boundary between the two. With respect to many locality phenomena beyond those above which I have claimed to be semantic, all I can say is that an event-structural approach is conceivable, but details remain to be worked out. However, some locality phenomena clearly fall outside the scope of the Event Structure Presupposition Hypothesis, and so need to find an explanation elsewhere.

#### Possible Extensions

Other cases where an event-structural explanation is plausible, but hasn't been worked out, include Erteschik-Shir's (1973) class of *manner of speaking* verbs, and the embedded root phenomena discussed by Hooper and Thompson (1973).<sup>73</sup> Erteschik-Shir is concerned with the acceptability of extraction from a complement clause past a verb of saying.

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assigned a  $\theta$ -role in either domain would be sufficient to satisfy the  $\theta$ -criterion, and so *John* in the above example could receive a  $\theta$ -role from T (Guéron's *T-controller*), rather than from either verbal predicate.

Alternatively, we might claim that *John* is the syntactic subject of *drive Mary crazy*, and the enrichment of this to arrive at the interpretation that John whistling drove Mary crazy happens at some post-syntactic interpretive level. Both of these hypotheses are tenable, but leave many details to be worked out, and accordingly I set them aside for this thesis.

<sup>73</sup>Thanks to Jeroen van Craenenbroeck for bringing the relevance of the latter to my attention.

Roughly speaking, the more fully specified the manner of saying is, the less acceptable the extraction, as in (281).<sup>74</sup>

(281) What did you V ((to) them) that he had done?

- a. **Acceptable:** say, tell, report, announce.
- b. **Questionable:** grunt, holler, murmur, mumble, mutter, roar, scream, shout, sigh, snort, stammer, wail, whine, tell, exclaim.
- c. **Bad:** purr, snarl, editorialize, eulogize, coo, jeer, rumble, simper, lisp, quip, croak, dictate, transcribe, ululate, animadvert. (Erteschik-Shir 1973:84)

The potential link to the sort of structures discussed in this thesis comes from the similarity between the class of manner-of-speaking verbs and the *lexical subordination* phenomena discussed by Levin and Rapoport (1988). These phenomena (see also Jackendoff 1990, Harley 2005) involve a series of constructions which seem to combine a light verbal structure with an additional manner component which comes to “name” the verb, as in (282).

- (282) a. The boat floated under the bridge  $\approx$  The boat went under the bridge, floating.
- b. Bill belched his way out of the restaurant  $\approx$  Bill went out of the restaurant, belching.

Somehow, then, in these constructions an event description of “floating” or “belching” comes to be conflated with an event description of “going under the bridge” or “going out of the restaurant” within a single clause. Bearing in mind the event-structural focus of the approach adopted in this thesis, it is not beyond the realms of possibility to claim that the ungrammaticality of the “questionable” and “bad” examples in (281) is related to the availability of similar paraphrases in those cases.

- (283) John sighed that Mary had left him  $\approx$  John communicated that Mary had left him, sighing.

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<sup>74</sup>These judgements were elicited from a single informant and are subject to quite high levels of inter-speaker variability. For myself, for example, the distinction between good and bad is much more categorical. Another confound is that many speakers find the baseline declarative sentences quite unacceptable in many cases. Regardless of all this, the implicational relations which Erteschik-Shir describes seem quite robust.

The hypothesis would be that whatever event-structural manipulations allow such lexical subordination render a structure incompatible with the Event Structure Presupposition Hypothesis: the event structure exemplified in (284a) is legitimate while that in (284b) is deviant.

(284) a. What did John say [that Mary did *t*]?

b. \* What did John sigh [that Mary did *t*]?

However, tempting though this line of inquiry may be, reconciling it with the theory developed so far is a non-trivial matter. The theory developed so far rests precisely on the premise that event-structural manipulations that look, at first sight, very similar to those involved in lexical subordination constructions are the very reason why extraction from adjuncts is possible in English in the first place. I therefore have to leave it as an open question whether there is some principled way to draw a line between these two sets of data.

Things maybe look more promising when it comes to the embedded root phenomena discussed in Hooper and Thompson (1973). Hooper and Thompson claim that Emonds' class of *root transformations* are not restricted to the root, but rather to clauses that denote asserted propositions, as opposed to presupposed propositions, questions or imperatives. To take just one example of a root transformation, termed *negative constituent preposing* by Hooper and Thompson, following Emonds, we see that this transformation can not only form (285b) from (285a), but also (285c–285e), where the transformed sentence is embedded beneath a verb of saying, a typical belief verb, and a semifactive, respectively. However, the root transformation cannot be applied to a sentence embedded beneath the verbs in (285f) or (285g). The matrix predicate in (285g) is a regular factive predicate, whereas the example in (285f) is distinct from the higher examples in that neither the speaker nor the subject commits themselves to the truth of the embedded proposition.

(285) a. I have never in my life seen such a crowd. (Hooper and Thompson 1973:467)

b. Never in my life have I seen such a crowd. (p.467)

c. I exclaimed that never in my life have I seen such a crowd. (p.474)

d. I believe that never in my life have I seen such a crowd.

- e. I know that never in my life have I seen such a crowd.
- f. \* I deny that never in my life have I seen such a crowd.
- g. \* He is surprised that never in my life have I seen such a crowd.

Hooper and Thompson make sense of this paradigm by claiming that those embedded contexts which permit the root transformation are the contexts in which the embedded proposition corresponds to the main assertion of the sentence, and the upstairs material constitutes a sort of “parenthetical” addition to that assertion. In contrast, the embedded proposition in (285f) is not asserted, as the speaker is not committed to its truth, and the embedded proposition in (285g) is presupposed rather than asserted.

One reason for optimism concerning an extension of my approach to these phenomena is that, unlike the data from Erteschik-Shir (1973) discussed immediately above, verbs of manner of speaking do not pattern with factive verbs in this case. That is, we can say (286a) just as easily as (285c), and it is not degraded like the factive (285g). This should be compared with the degraded (286b).

- (286) a. I hollered [that never before had I seen such a crowd].
- b. \* Who did you holler [that you had seen *t*]?

We saw earlier in this section that an extension of my approach to cover the degradation of extraction past a verb of manner of speaking was certainly not straightforward, and here, it is unnecessary, as verbs of manner of speaking pattern with regular verbs of saying.

However, an account of Hooper and Thompson’s data within my framework does have some problems of its own. Most pertinently, although the discussion of extraction from complement clauses and of factive islands in section 3.3 shows that we are able to distinguish presupposed complements from others with respect to event structure, we have no obvious means to make the necessary further distinction between asserted complements such as (285a) and complements that are neither asserted nor presupposed, such as (285f). To put the problem in a different light, although the system discussed in section 3.3 has a mechanism for treating presupposed constituents differently from others, it has no mechanism built in for treating asserted constituents differently from others, and Hooper and

Thompson's theory rests on this further distinction. Although there is no inherent incompatibility between the approach developed in this thesis and Hooper and Thompson's data, then, the full story lies beyond the scope of this thesis.

Finally, there is a tantalising similarity between the approach described here and Kehler's (2002) coherence-based approach to the Coordinate Structure Constraint and its violations. For Kehler, the applicability of the CSC is determined by the type of relation holding between the conjuncts. If they are simply parallel to each other (a *resemblance* relation), then the CSC applies. If, however, the two conjuncts stand in a relation of cause and effect, or temporal contiguity, then the CSC is lifted and extraction is possible from one or more conjuncts without obeying the across-the-board requirement noted by Ross (1967).

The standard case of the CSC is illustrated in (287). Here, the interpretive relation holding between the two conjuncts is what Kehler terms a *parallel* relation, which amounts roughly to conjunction, plus a requirement that the internal structure of the two events be similar (see Kehler 2002 for a more precise formulation of this intuition). In such a case, extraction from a single conjunct is impossible unless all conjuncts are extracted from.

(287) a. \* What book did John [buy *t*] and [read the magazine]?

b. What did John [buy *t*] and [read *t*]?

This much of the CSC, in one form or another, has been part of standard syntactic theory for forty years now. However, an elegant account of the observed exceptions to the CSC, also originally noted by Ross in many cases, has been much less readily forthcoming. Kehler's innovation is to tie the distribution of these exceptions to a taxonomy of *coherence relations* holding among linguistically expressed propositions. In contrast to the parallel case discussed in (287), a second coherence relation, *cause-effect*, is found, for example, when the first conjunct is interpreted as leading to the second (288a), or when it *should* lead to the second, but exceptionally doesn't (288b). In each of these cases, it is quite grammatical to extract from either conjunct while leaving the other intact.

(288) a. That's the stuff that the guys in the Caucasus [drink *t*] and [live to be a hundred].

b. That's the table that I [drank too much] and [stumbled into *t*].

Finally, when the relation that holds among propositions is one of *narration*, as in (289), then extraction violating the ATB restriction is once again legitimate, as shown in (289a).



However, in this case extraction is subject to a constraint that, regardless of which other conjuncts contain traces, the last conjunct must do so.<sup>75</sup>

(289) a. What did Harry [buy *t*], [come home], and [devour *t* in thirty seconds]?

b. \*What did Harry [buy *t*] and [come home]? (all examples except (288b) taken from Kehler 1996. See that paper for original sources.)

Although I won't go into the details of why the extraction possibilities should line up with the choice of coherence relation in precisely this way (an issue discussed at length in Kehler 2002), it is clear that this gives us at least the start of a principled explanation for the fact that, on the one hand, the CSC holds quite robustly in a good many cases, but on the other hand, there are too many exceptions to simply ignore. Moreover, this is clearly very close in spirit to the current proposal: in both cases, seeing two semantic units as part of a larger asymmetric and irreducibly semantic structure lifts a condition on extraction which initially appears to be syntactic.

However, a full unification faces nontrivial problems when it comes to the details. A first major problem concerns the role of purely temporal relations, which suffice to allow extraction in the CSC case. In contrast, this thesis has shown, most clearly in the discussion of *before* and *after* in section 3.2.3, that a temporal relation between matrix VP and adjunct is insufficient to allow felicitous extraction from an adjunct, but that such relations must be enriched to a contingent relation if extraction is to be possible. Secondly, the overall shapes of the solutions proposed by Kehler and by me are different. For Kehler, what matters is any parallelism requirements that a particular relation among propositions may impose on subcomponents of those propositions. In other words, the shape of the coherence relation determines the shape of the extraction possibilities, but *some* extraction (at the very least, by Across The Board movement) is always possible. In contrast, for me, a single family of relations among events is privileged, at the expense of other attested relations, as, by hypothesis, only the contingent relations are able to relate subevents of a single macroevent.

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<sup>75</sup>It may be objected quite legitimately that (289b) no longer feels like a narration without the final conjunct, and has instead a status much closer to that of the examples in (287). Indeed, adding an appropriate final conjunct to (287a) can induce a narration-like reading, as in (i).

(i) What did John [buy *t*], [read the magazine], and [suddenly regret buying *t*]?

However, this is all quite compatible with Kehler's theory. The important point is that, even if we attempt to force a narrative interpretation on (289b), the example remains ungrammatical.

Once again, then, the intuitive similarity between an already extant proposal and the one outlined here appears to founder when the details are considered, and I have to leave the question of whether there is some common core to be found for the future.

Moving beyond these cases, though, we find that certain phenomena, concerning both extraction from adjuncts and wider locality issues, are clearly outside the scope of the Event Structure Presupposition Hypothesis. I will discuss two of these in the rest of this section.

### Subject Islands

The first class of cases which the Event Structure Presupposition Hypothesis clearly cannot cover can be found when the dividing line between grammatical and ungrammatical extractions relates to some structure distinct from event structure. A case in point is the class of *subject islands*, which are unlikely to fall under the Event Structure Presupposition Hypothesis as they are classically defined in terms of grammatical function rather than any fixed event-structural notion. These are normally grouped (for example by Huang 1982, Uriagereka 1999 and Johnson 2002) with adjuncts as prototypical strong islands. For example, Johnson gives the following paradigm, contrasting legitimate extraction from a complement with illegitimate extraction from a subject or adjunct, and derives it from his ‘adjunct island condition’ (291), in an expanded sense of *adjunct* which also covers subjects.

- (290) a. Who did Betsy speak to an advocate for before the discussion?  
       b. \* Who did an advocate for speak to Betsy before the discussion?  
       c. \* Who did an advocate speak to Betsy before a discussion of? (Johnson 2002:2)
- (291) a. If an XP is in an adjunct position, nothing may move out of it.  
       b. An adjunct is a phrase whose sister is also a phrase and whose mother is not its projection. (Johnson 2002:1)

However, there is evidence that extractions from subjects and adjuncts pattern quite differently, both crosslinguistically and within a given language. In fact, an apparent double dissociation can be found by comparing English and Russian. We have seen that the adjunct condition applies only sporadically in English, to the point where I have claimed that the

true generalisation does not actually make reference to adjunction. However, the subject condition applies quite generally in English: the few exceptions which have been noted in English over the years (Sauerland and Elbourne 2002, Levine and Sag 2003, Chomsky 2004) appear to obey quite different conditions from the adjunct cases. For example, Chomsky (p.7) observes that the acceptability of extraction from a subject is related to whether that subject is an internal or external argument, such that, according to Chomsky's judgement, the examples of extraction from a derived subject in (292) pattern with the cases of extraction from an object in (293) rather than those of extraction from an external subject in (294).<sup>76</sup>

(292) a. It was the CAR (not the TRUCK) of which [the (driver, picture) was found].

b. Of which car was [the (driver, picture) awarded a prize]?

(293) a. It was the CAR (not the TRUCK) of which [they found the (driver, picture)].

b. Of which car did [they find the (driver, picture)]?

(294) a. \* It was the CAR (not the TRUCK) of which [the (driver, picture) caused a scandal].

b. \* Of which car did [the (driver, picture) cause a scandal]? (Chomsky 2004:7)

Note, moreover, that the subject island violations discussed by Chomsky display a strong preference for extraction of PPs over extraction of nominals. This is in contrast to the general preference in English for stranding prepositions. So while it is more natural for most English speakers to say (295a) than (295b), and while pied-piping of a preposition from within a weak island as in (296b) is flatly bad (compare the P-stranding (296a)), quite the opposite pattern is found when comparing the sharply degraded (297b) to the relatively acceptable (297a).<sup>77</sup>

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<sup>76</sup>If I understand correctly, Sauerland and Elbourne (2002) make a more restrictive claim, which imposes the additional requirement that the derived subject must be a scope-taking element, which interacts with some other scope taking element, and finally, that the subject takes narrow scope with respect to that scope taking element (in their terms, the derived subject reaches subject position by PF-movement rather than regular A-movement). Only if all these conditions are met is extraction from a subject possible, according to Sauerland and Elbourne. Presumably, their theory would therefore predict an example such as (292b) to be ungrammatical. Interestingly, Sauerland and Elbourne's examples also do not follow the pattern of Chomsky's discussed in the main text, in that extraction of DP is just as possible as extraction of PP in Sauerland and Elbourne's cases. I will not attempt to sort out these empirical issues in such a gradient and fragile area, however.

<sup>77</sup>Finding any consensus concerning the evaluation of the subject island cases has become quite tricky in the wake of the circulation of Chomsky (2004), in particular concerning the severity of the effect of stranding the preposition. Pending a better understanding, though, this at least appears to be the dominant trend.

(295) a. Who did you talk to?

b. To whom did you talk?

(296) a. Who do you wonder whether John will talk to?

b. ?? To whom do you wonder whether John will talk?

(297) a. Of which car was the driver of awarded a prize?

b. ?? Which car was the driver of awarded a prize?

In contrast to the subject subextraction pattern in (297), though, (298) shows that extraction of anything other than a referential (in the sense of Cinque 1990) DP complement from an adjunct island is sharply degraded.

(298) a. The man that I went to England without speaking to *e*

b. \* The man to whom I went to England without speaking *e* (Chomsky 1982:72–3)

In this respect, the pattern of admissible extractions from adjuncts in English is quite the opposite of the pattern of extractions from subjects, which poses a challenge to any proposed unification of the two.

A further reason for differentiating subject islands from adjunct islands can be found in the results of the magnitude estimation tests reported by Sprouse et al. (2007). Sprouse et al. compare grammaticality judgements, elicited through magnitude estimation, for a range of overt and covert island conditions. For the most part, their results confirm Huang's (1982) claim that covert *wh*-movement is not sensitive to islands. However, there is one exception, namely that covert *wh*-movement from within a subject island is judged to be degraded to a statistically significant extent, relative to a non-island-violating control. The full paradigm given is as follows: (299a) tests the acceptability of a multiple *wh*-question with an embedded *wh* object *in situ*. This can be compared with (299b), where the *in situ wh*-phrase is embedded within an embedded object, and also with (299c), where the *in situ wh*-phrase is an embedded subject rather than an embedded object. All of these conditions received almost identical grammaticality ratings, showing that covert extraction of a subject or covert extraction from within a complement is just as acceptable as the

baseline of covert extraction of a complement. However, when these are compared with (299d), where the *in situ wh*-phrase is embedded within an embedded subject, this latter is judged to be significantly degraded.

- (299) a. Who thinks that a bottle tripped who?  
 b. Who thinks that a bottle of wine tripped the manager of what?  
 c. Who thinks that what tripped the manager?  
 d. \* Who thinks that a bottle of what tripped the manager?

In contrast, a similar paradigm involving adjunct islands does not show a parallel degradation: although (300a), with the *in situ wh*-phrase within a complement, is perceived as slightly more acceptable than (300b), where the *in situ wh*-phrase is within an adjunct, the effect does not reach significance.

- (300) a. Who thinks that you forgot what at the office?  
 b. Who laughs if you forget what at the office?

Sprouse et al. conclude that there is evidence for a covert subject island effect but not a covert adjunct island effect.<sup>78</sup> Whatever the explanation for this fact may turn out to be, for our purposes it constitutes another piece of evidence for the disunity of the cases originally brought together under the CED.

Already, then, we have several reasons to suspect that the exceptions to the subject and adjunct island conditions do not have the same source in English. This view can be strengthened by comparing English with Russian, which shows quite the opposite pattern. We find many examples of dependencies between a fronted *wh*-phrase and a gap contained within the subject in Russian, as in (301), but similar dependencies involving a gap within an adjunct, as in (302), are uniformly rejected.<sup>79</sup>

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<sup>78</sup>Clearly, this conclusion is independent of whether the analysis of *wh in situ* or multiple *wh* questions involves literal covert movement or not.

<sup>79</sup>The exact pattern of Russian subject island violations is not completely clear to me. The example in (301) involves extraction from a postverbal subject. Examples of extraction from a preverbal subject, as in (i), are readily accepted, but they are widely assumed to have a “parenthetical” feeling, suggesting that they do not involve separation of the two parts of the subject by movement, but rather by some form of “intrusion” of *ty dumaesh*.

- (301) Kakaja      tebya      ukusila sobaka?  
Which.NOM you.ACC bit      dog.NOM  
Which dog bit you?

- (302) a. \* Kogo      Masha      pozvonila mne posle togo kak Ivan      vstretil?  
Who.ACC Mary.NOM called      me after      John.NOM met  
Who did Mary call me after John met?

- b. ?? Komu      Ivan ušol ne posvoniv?  
Who.DAT John left not call.ADV  
Who did John leave without calling?

- c. \* Komu Ivan prišol      dlya togo čtoby pozvonit’?  
Who John came.PERF for that to call.INF  
Who did John come (here) to call?

- 
- (i) Čja      ty думаеш sobaka      ukusila Mariju?  
Whose.NOM you think dog.NOM bit Mary.ACC  
Whose dog do you think bit Mary?

This “parenthetical” hypothesis receives some support from the fact that, once we change the matrix verb to one which obligatory requires the subjunctive complementiser *čtoby* (generally taken to be the only complementiser which allows movement from an embedded clause), extraction is generally rejected.

- (ii) \* Čja      ty xotela čtoby      sobaka      ukusila Mariju?  
Whose.NOM you wanted comp.SUBJ dog.NOM bit Maria.ACC  
Whose dog did you want to bite Mary?

Moreover, the degradation of an example such as (ii) cannot be simply due to a that-trace effect, as it is possible to construct examples such as (iii), which are still rejected by a majority of my informants, but where the extraction site is no longer adjacent to the complementiser.

- (iii) \* Čja      ty xočeš čtoby      menja sobaka      ukusila?  
Whose.NOM you want comp.SUBJ me dog.NOM bit  
Whose dog do you want to bite me?

Strikingly, then, the putative examples of extraction from a subject in Russian that I have been able to elicit seem to fall into two classes, namely those which can be analysed as parentheticals and those where the subject is postverbal. These complement a third class, based on examples from Stepanov (2007), of extraction from a preverbal nonfinite clausal subject as in (iv–v).

- (iv) S      kem by ty xotel čtoby      govorit’ bylo by      jedno udovol’stvie?  
with whom SUBJ you wanted that.SUBJ to-speak were SUBJ one pleasure  
With whom would you want that to speak were sheer pleasure?

- (v) Čto by ty xotel čtoby      kupit’ ne sostavljalo by      nikakogo truda?  
what SUBJ you wanted that.SUBJ to-buy not constitute SUBJ no labor  
What would you want that to buy would not be any trouble? (Stepanov 2007:91)

We cannot claim, then, that extraction from Russian subjects is completely free. However, it is clear that the extractions are not restricted in terms of the argument structure status of the subject as they are in English, as (301) involves extraction from an external subject, albeit a postnominal one.

- d. \* Kako<sub>j</sub> Ivan šol      pozadi sobaki  
    Which John walked behind dog.GEN  
    Which dog did John walk behind?

This contrast between extraction patterns in Russian and English would represent a surprising double dissociation if subject and adjunct islands had the same source.

So what do we do with subject islands? One possibility is that the distinction between subject and adjunct has its source outside narrow syntax, either on the PF side or in the processing component. Such a possibility has a long history in syntactic theory, including any definition of government including a notion such as *canonical direction* or *recursive side* (see in particular Kayne 1983). It also has empirical benefits, in that it assimilates subject islands to a larger group of structurally similar elements, namely leftward specifiers (therefore approaching Ross' controversial *Left Branch Condition*). A second prominent case which matches this description is any moved phrase.<sup>80</sup> Rizzi (2006) has proposed the generalisation that any A'-moved constituent becomes a strong island, by a process which he calls *criterial freezing*. If this is on the right track, the correct generalisation, at least in English, may be that any leftward specifier is a strong island. Now, given that Bare Phrase Structure theory (e.g. Chomsky 1994) takes narrow syntax to be essentially a recursive process of formation of unordered sets, with imposition of order on terminals taking place elsewhere, any such notion of directionality must be outside narrow syntax, having effects at the PF interface and in our processing of sentences by assigning hierarchical structure to ordered strings of words. It seems likely, then, that such considerations are quite separate from the LF-oriented Event Structure Presupposition Hypothesis.

One current processing theory which gives us this result is found in Bianchi and Chesi (2006). Bianchi and Chesi assume a top-down model of incremental structure building in which a filler, when encountered, is stored in a memory buffer. At the end of each phase, this memory buffer should either be empty, or its contents should be passed on to a *sequential phase* (the lowest phase selected by, and following, the head of the current phase). Subjects, however, can never be sequential phases, as they are always preverbal, and so will be embedded within the current phase rather than following it in linear terms. Extraction from such *nested phases* is taken to be impossible. By restricting renewal of the memory buffer, and so processing of long-distance filler-gap dependencies, to sequential phases,

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<sup>80</sup>Of course, if the VP-internal Subject Hypothesis proves to be correct, then subjects are moved phrases too, further adding to the similarity.

then, Bianchi and Chesi exclude the possibility of extraction from subjects. This is quite independent of the treatment of extraction from adjuncts. If it is possible to consider adjuncts as sequential phases by making the definition contingent on some more liberal notion of *selection* (as suggested to me by Valentina Bianchi), then such a parsing theory could provide an account of the limited availability of extraction out of subjects while saying nothing about the possibility of extracting from an adjunct. This would be a step towards a nonunified, empirically superior, post-CED theory of subject and adjunct islands.<sup>81</sup>

### Weak Islands

It seems, then, that the class of strong islands, or at least these central members of it, may eventually be reducible to factors outside of narrow syntax. However, this leaves the quite different behaviour of *weak* islands. This is particularly relevant, as the extractions from adjuncts which form the core data discussed here nonetheless display the hallmarks of weak islandhood. Following Cinque (1990) and Szabolcsi (2006), the principal diagnostic of a weak island is that only referential DPs can extract from them. We see that this is very much the case here: as (303), based on similar examples in Rizzi (1990), shows, extraction of a non-DP or a nonreferential DP from a weak island, even if it is an argument, is very strongly degraded in comparison.

(303) a. A: ? What did John wonder whether they weighed last week?

B: Apples.

B: \* Sixty kilos.

b. \* How did John wonder whether to behave?

Exactly the same patterns are found in cases of extraction from adjuncts, as shown in (304–305).<sup>82</sup>

(304) a. Who did John drive Mary crazy [talking about *t*]?

b. \* About whom did John drive Mary crazy [talking *t*]?

<sup>81</sup>See also Stepanov (2007) on the desirability of such a theory. Stepanov continues to assume, however, that extraction from an adjunct is universally impossible.

<sup>82</sup>For many speakers, extraction from adjuncts also shows the same small amount of degradation and pre-suppositional nuance which intuitively “feels like” a weak island. Such intuitions are notoriously hard to pin down, however, so I stick to the robust categorial distinction here.



c. A: ? What did John drive Mary crazy [weighing *t*]?

B: Her relatives, one at a time, *ad nauseam*.

B: \* 150 kilos.

(305) a. Who did John go home [without talking to *t*]?

b. \* To whom did John go home [without talking *t*]?

c. A: ? What did John fight a heavyweight boxer [without weighing *t*]?

B: His boxing gloves. B: \* 100 kilos.

Cinque convincingly argues that this distinction is related to the availability of two separate ways of forming A'-dependencies. On the one hand, regular successive-cyclic movement can target any category. On the other hand, a *wh*-phrase may bind a null pronominal, giving the impression of long *wh*-movement. As pronominals can only replace nominals, however, this latter route is restricted to DP dependencies. This successfully explains the distribution in (304–305). However, it is quite independent from the discussion in terms of the Event Structure Presupposition Hypothesis above. Reformulated in the light of Cinque's proposal, the Event Structure Presupposition Hypothesis describes a condition on the availability of the binding subclass of A'-dependencies, while leaving the distribution of successive-cyclic *wh*-movement untouched. The unavailability of true *wh*-movement (in Cinque's terms) out of adjuncts is, in principle, a separate fact, then. Moreover, it may prove to be syntactic in nature. Certainly, the most widely-accepted account of weak islands makes use of a purely syntactic notion of relativised minimality or feature visibility (see Rizzi 1990, Chomsky 1995, 2001, Starke 2001, and see also Szabolcsi and Zwarts 1993 for an intriguing alternative, based on scope requirements and the algebraic structures of the denotations of different elements):<sup>83</sup> the distribution of movement depends on the cases in which a feature on a goal can be “seen” by a probe to form an Agree relation, a prerequisite for movement. If some intervener or phase boundary makes a feature invisible, then successive-cyclic movement cannot take place, regardless of the category of the goal. However, the alternative method of forming A'-dependencies through binding of a null pronominal allows referential DPs, and only referential DPs, to apparently escape a weak island via long *wh*-movement.

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<sup>83</sup>In principle, these two alternatives could both be correct, and describing different facets of the same phenomenon. See Szabolcsi (2006) for a detailed comparison of the merits of the two approaches.

Although we have seen evidence for removal of significant portions of locality theory from narrow syntax, then, both in the event-structural effects explored in depth in this thesis, and the directionality factors noted above, we see that such factors only affect strong islands. Weak islands appear to retain irreducibly syntactic characteristics, not least concerning the effects of Cinque's movement/binding distinction. This thesis has aimed to derive the patterns of exceptions to the strong islandhood of adjuncts, and by doing so, cast doubt on strong islands both as a unified class, and as a purely syntactic phenomenon. However, the *weak* islandhood of adjuncts is a quite different, and quite plausibly narrowly syntactic, story.



# Chapter 4

## Conclusion

There was a basic empirical problem at the heart of this thesis, but unravelling it has taken us quite far from the point of departure. The empirical problem is a simple one: current theories of adjunct islands apply quite blindly, and so there is little room for manoeuvre when it comes to observed cases where adjuncts don't behave like strong islands. Moreover, the classes of legitimate extractions from adjuncts pattern in ways which are quite the opposite of what syntactic locality theory has brought us to expect. Four puzzles were laid out in the introduction, which pose clear challenges to any syntactic theory of extraction from adjuncts. All four puzzles can now be explained, in terms of the theory developed in the preceding chapters.

**The Restricted Extraction Puzzle** detailed a disparity between the extraction possibilities of different classes of adjunct. *In order* clauses allow quite free extraction of complement DPs, as shown by (2), whereas bare present participial adjuncts find the acceptability of extraction of complement DPs to be contingent on the aspectual class of the matrix VP, as well as a host of other factors explored in section 3.2.4. The basic data is repeated below.

- (2) a. What did you come round [in order to work on *t*]?  
b. Which paper did John travel halfway round the world [in order to submit *t*]?  
c. What did Christ die [in order to save us from *t*]?  
(3) a. **Adjunct describes an accomplishment:** ✗ What did John drive Mary crazy [building *t*]?  
b. **Adjunct describes an activity:** What did John drive Mary crazy [whistling *t*]?

- (4) a. **Matrix VP describes an accomplishment:** What did John drive Mary crazy [whistling *t*]?  
b. **Matrix VP describes an achievement:** What did John arrive [whistling *t*]?  
c. **Matrix VP describes an activity:** \* What does John work [whistling *t*]?  
d. **Matrix VP describes a state:** \* What does John know French [whistling *t*]?

To be sure, a syntactocentric explanation for these facts is not inconceivable. Imagine, for example, that bare present participial adjuncts are introduced by one of two null operators, depending on the aspectual classes of the matrix VP and the adjunct (which could be cashed out in terms of aspectual projections, for syntactocentric purism). Now, one of these two null operators is an intervener for extraction, whereas *in order*, and the other null operator, are not. In principle, there is nothing to stop such an explanation, but in the absence of any supporting evidence for the presence of two null operators, their distribution, and their different status with respect to intervention, the details remain entirely obscure.

In contrast, the theory in chapters 2 and 3 predicts just such a contrast. The crucial assumption, ignoring larger event groupings for now, is that events come in two sizes, core events and goal-related extended events. In the absence of any explicit marking of goal-orientation, the denotations of bare present participial adjuncts are restricted to the class of core events, which correspond roughly to the events underpinning the aspectual classes of Vendler (1957). This is why aspectual class has such an influence. On the other hand, *in order* clauses do explicitly mark goal-orientation, and so extended event structure is automatically available, with the adjunct specifying the goal of the activity described in the matrix VP. This means that *in order* clauses automatically form a macroevent with their VP hosts, while macroevent formation is contingent on matters related to aspectual class in the case of bare present participial adjuncts. The Event Structure Presupposition Hypothesis therefore predicts unrestricted extraction from the former, but only extraction in certain cases from the latter.

**The Restricted Answers Puzzle** concerned cases where the acceptability of a question depended partly on the expected answer to that question. This is shown particularly clearly by prepositional participial adjuncts, as in the examples repeated below.

- (5) A: Which book did John design his garden [after reading *t*]?

B: An introduction to landscape gardening.

(6) A: Which book did John design his house [after reading *t*]?

B: # *Finnegans Wake*.

A syntactocentric account of extraction from adjuncts would have little chance here. The upper size limit of syntactic structures is, in normal circumstances, the sentence. Here, though, the acceptability of one utterance is contingent on a subsequent utterance in the discourse. Syntax is not built to handle this sort of pattern on its own. In the light of the Event Structure Presupposition Hypothesis, though, we expect just such a pattern to emerge. The prepositions which give rise to this pattern are those which do not specify a contingent relation between the two events in question, but only a weaker relation, such as a temporal relation. We saw in section 2.4 that the relevant class of relations among events for the Event Structure Presupposition Hypothesis consists only of contingent relations among the subevents of a given macroevent, and specifically not temporal relations. In order to accommodate this presupposition, the noncontingent relation expressed by a preposition such as *after* must be enriched to give a contingent reading. However, the feasibility of this enrichment depends on the answer to the question, as shown in section 3.2.3. In this way, the presupposition concerning the relation among events boils down to a presupposition concerning the answer to the question. If the actual answer does not meet that presupposition, the exchange is anomalous.

**The Interpretive Puzzle** focused on two surprising interpretive asymmetries concerning bare present participial adjuncts. Firstly, the available interpretations of the relation between matrix and adjunct events in an interrogative sentence form a proper subset of those available in a declarative sentence, as shown by contrasting the degraded accomplishment case (12) and the degraded achievement case (13) with the legitimate cases of extraction in (4).

(12) a. John painted this picture eating apples.

b. \* What did John paint this picture [eating *t*]?

(13) a. John came home dripping mud all over the living room carpet.

b. ??/\* What did John come home [dripping mud on *t*]?

- (4) a. **Matrix VP describes an accomplishment:** What did John drive Mary crazy [whistling *t*]?  
b. **Matrix VP describes an achievement:** What did John arrive [whistling *t*]?

Secondly, the interpretations available in the legitimate cases of extraction from adjuncts differ in the accomplishment case, where a causal reading is strongly preferred, and the achievement case, where only an interpretation of immediate temporal precedence is readily available.

This intricate pattern of facts was analysed in terms of the operator *Op* from section 2.6. Structural ambiguities in the height of attachment of this operator automatically generate readings consisting of a single event grouping and multiple event groupings for every example. However, only the single-grouping readings are legitimate with respect to the Event Structure Presupposition Hypothesis, which regulates only the extraction cases. The question then becomes one of which interpretations are legitimate within a single grouping. The event described by a bare present participial adjunct is agentive in every instance considered here. Moreover, we assume that the preparatory process in an accomplishment is necessarily agentive, and the preparatory process in an achievement is necessarily nonagentive. In that case, the only way to meet the condition, embodied in the Event Structure Presupposition Hypothesis, that an event grouping contains at most one agentive event, is to identify the adjunct event as the preparatory process which directly causes the culmination in the accomplishment case. On the other hand, in the achievement case, such identification is impossible, as the preparatory process is nonagentive by definition and the adjunct event is agentive. In that case, the only possible interpretation is one where the adjunct event co-occurs with the preparatory process leading to the matrix culmination, but is distinct from that process. This gives an interpretation of immediate temporal precedence without causation.

Finally, **The Unlikely Antilocality Puzzle**, the last of the four, concentrates on a tension between the typical syntactic locality pattern, which privileges short movement steps, and some further data concerning bare present participial adjuncts, including the following.

- (14) a. ?? What did John drive Mary crazy [fixing *t*]?  
b. What did John drive Mary crazy [trying [to fix *t*]]?

The preference for shorter steps in syntactic theory comes from a fundamental asymmetry in locality theory. We assume certain elements to be interveners, hindering movement, but we do not have a class of *facilitators*, helping movement on its way. When comparing a longer movement A with a shorter movement B, such that the nodes traversed by A are a proper superset of the nodes traversed by B, the best case, then, is that none of the extra nodes traversed by movement A act as interveners, in which case A and B should be equally acceptable. Putting antilocality theories aside, as we have seen good reason to assume they are irrelevant to the present case, there is no way for the longer movement A to be preferred over B.

Data such as (14) are doomed to remain anomalous in a purely syntactic theory, then. However, the contrast is exactly as expected on the present approach. As mentioned in section 3.4, although (14b) is *syntactically* more complex than (14a), it is *aspectually* simpler, in that *try* can take an accomplishment-denoting complement and yield an activity. And, as we saw in section 3.2.4, extraction from bare present participial adjuncts is contingent upon core event formation, which, in turn, is only possible if the adjunct denotes an activity. The degradation of (14a) in comparison to (14b) is therefore due to the necessity of coercing the accomplishment *fix* into an activity-denoting reading in (14a).

Such factors strongly suggest that we must move away from the notion that there is a syntactic adjunct condition, at least in English. However, this thesis is only partly about extraction from adjuncts. It also has a wider architectural and methodological point to make. Most widely accepted minimalist grammatical architectures have one common feature, namely a radically impoverished narrow syntactic component complemented by an increased reliance on interface conditions to take up the slack left by simplification of the syntax. However, there is a strong tendency in syntactic theory to assume that the mapping between syntax and the interfaces is more or less direct. At the PF interface, we need look no further than the LCA (Kayne 1994, Chomsky 1995), which removes the need for a substantial linearisation algorithm in the syntax→PF mapping by stipulating a homomorphism from asymmetric c-command in the syntax to linear precedence in the phonology. At the LF interface, classic examples of this trend include UTAH (Baker 1988), which reduces hierarchical effects among arguments to similarly hierarchical properties of phrase structure trees, or the decompositional approaches to event structure explored by Lakoff (1970) and Hale and Keyser (1993).



Such theories are in principle pulling in the opposite direction from the basic minimalist hypothesis explored by Chomsky, in that they take factors with clear interface, or post-interface, effects and reintegrate them into the syntax. In contrast, the theory proposed here rests on a conception of event structure which is motivated on grounds entirely independent from phrase structure, and which has structural properties quite distinct from phrase structure, as demonstrated in section 3.4. Although the details of the proposal presented here are bound to be proved wrong in the fullness of time, and although many areas remain unexplored (most notably the cross-linguistic extent of the kinds of extraction discussed here, the extension to other types of  $A'$ -dependencies, and the reason why *wh*-movement should carry such a presupposition in the first place), one conclusion that I hope to have placed beyond reasonable doubt is that the attested patterns of acceptable extraction from adjuncts are systematic, but that the system is quite distinct from the system assumed to underlie phrase structure. This is concordant with a genuinely minimalist model of syntax, in which independently necessary structures at the interfaces and beyond can constrain acceptability of sentences in much the same way as factors regulating phrase structure, and each component of the overall system can be allowed to fully pull its weight.

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