

# Event arguments, adverb selection, and the Stative Adverb Gap\*

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## Abstract

The central issue here is how to account for a particular case of verb-adverb selection. Many adverbs are restricted from appearing with all stative verbs but almost none are restricted from appearing with (all) eventive verbs. This fact – the Stative Adverb Gap – is here argued not to stem from arbitrary semantic selectional restrictions but is argued to reflect a fundamental type-logical difference between the denotation of stative verbs and eventive verbs. Stative verbs combine with so few types of adverbials because they lack an eventuality argument. The consequences of this assumption are then explored.

## 1. Introduction

In early work on adverbial modification (Jackendoff 1972; Thomason and Stalnaker 1973), a fundamental syntactic distinction was drawn between S-adverbs and VP-adverbs. S-Adverbs such as *probably* and *luckily* appear relatively “high” in the sentence and are ruled out sentence finally, while VP-adverbs such as *quickly* and *merrily* appear “lower” and are permitted sentence finally. Thomason and Stalnaker argued that S-adverbs and VP-adverbs are also to be distinguished semantically. They claimed that S-adverbs are propositional modifiers, while VP-adverbials are predicate modifiers; that is, the distinction between them is articulated in terms of the semantic objects that they modify. This difference was taken to account for (some of) the distributional contrasts between the two classes, for example the fact that the S-adverb *probably* is acceptable in (1a) while the VP-adverb *quickly* is ruled out in (1b).

- (1) a. *It was probably true that Bill kissed Jill.*  
b. \**It was quickly true that Bill kissed Jill.*

One of the additional features that distinguishes S-adverbs from VP-adverbs is their selectivity. Generally speaking, S-adverbs are unrestricted with respect to the sentences they appear in, while VP-adverbs are sensitive to the

type of verb they modify. For example, although *probably* can appear in both (2a) and (2b) – with both *love* and *kiss* – *quickly* can only appear in (3b) – modifying *kiss* but not *love*.

- (2) a. *John probably loved Mary.*  
 b. *John probably kissed Mary.*
- (3) a. \**John loved Mary quickly.*  
 b. *John kissed Mary quickly.*

Thomason and Stalnaker noted that this type of verb–adverb selection could not be accounted for directly on their theory. Since *love Mary* is every bit as much a predicate as *kiss Mary* is, there is no type-theoretic reason why (3a) should not be acceptable. To account for such contrasts, they suggested that predicates be marked “stative” or “eventive”, and that VP-adverb modification be made sensitive to this marking.

What Thomason and Stalnaker failed to note, however, was a very important asymmetry in verb–adverb selection. While adverbs such as *quickly* select against stative verbs and for eventive verbs, there do not seem to be adverbs that select for stative verbs and against eventive verbs. That is, we do not find an adverb that fits the schema in (4).

- (4) a. *John loved Mary ADVERB.*  
 b. \**John kissed Mary ADVERB.*

Put another way, if an adverb can felicitously modify a stative verb, then it can also felicitously modify an eventive verb, but not the other way around. This lexical gap, which we will call the “Stative Adverb Gap” (SAG), is striking and should be accounted for by any theory of adverbial modification. In this paper, I discuss why the SAG is particularly problematic for the popular neo-Davidsonian theories of sentence interpretation of the type proposed by Bach (1986), Parsons (1990), Wyner (1994), and others. Then I present an alternative, which I call the “classical Davidsonian” theory, from which the SAG follows as a natural consequence.

## 2. Neo-Davidsonian theory

Neo-Davidsonian approaches to sentence semantics have grown in popularity since the early work of Bach (1981) and Parsons (1985). While such theories have been applied to a wide range of empirical phenomena, their

first and principle application is to the treatment of adverbial modification. To review briefly, the fundamental neo-Davidsonian assumption is that verbs denote predicates of eventualities (states or events) as do VP-adverbs, and that, semantically, VP-adverbial modification is (essentially) simple conjunction (see Parsons 1990; Kamp and Reyle 1993; or Wyner 1994 for details). The derivation in (5) illustrates the main features of the approach.

- (5) a. *John leave*;  $\lambda e$  [leave(e,John)]  
 b. *slowly*;  $\lambda P \lambda e$  [P(e) & slow(e)]  
 c. *John left slowly*;  $\exists e$  [leave(e,John) & slow(e) & e <now]

The sentence *John left slowly* is taken to make the claim that there was a leaving event of which John was the agent and which was slow. This analysis accounts straightforwardly for the most obvious semantic fact about adverbial modification, namely that a modified sentence such as *John left slowly* entails the unmodified *John left*. VP-adverbs simply add conjunctive information about the eventuality introduced by the verb. (In many neo-Davidsonian accounts, tenses are also taken to add conjunctive information, locating the time at which the eventuality occurs with respect to the speech time, as I have indicated in the final conjunct of the logical analysis in (5c).) It should be noted that on the neo-Davidsonian account, the contrast between S-adverbs and VP-adverbs is not between propositional modifiers and predicate modifiers, but rather between propositional modifiers and event predicates.

An appealing innovation of the neo-Davidsonian approach – one that is central to our concerns here – is the treatment of Vendler/Dowty-type aspectual classes (Vendler 1967; Dowty 1979). Since verbs are interpreted as predicates of eventualities, the distinctions among the aspectual classes can be characterized in terms of properties of these eventuality predicates. One straightforward characterization is the following (taken from Bach 1986):

- State verbs are those verbs that denote predicates of states (= stative verbs; the non-stative verbs below are subsumed under eventive verbs).
- Activity verbs are those verbs that denote predicates of homogeneous events.
- Accomplishment verbs are those verbs that denote predicates of non-homogeneous events.
- Achievement verbs are those verbs that denote predicates of momentary events.

Thus on the neo-Davidsonian approach, the troublesome question of what it is that the Vendler classes classify is given a reasonable answer: They classify predicates of eventualities. This perspective has led to significant and fruitful work, particularly on the topic of “aspectual shift” (Krifka 1989, 1992).

It presents us, however, with a puzzle. Since on the neo-Davidsonian theory, adverbs (like verbs) denote eventuality predicates, we can classify adverbs in Vendlerian terms as well. And, in fact, there appear to be “activity” adverbs, “accomplishment” adverbs, and “achievement” adverbs – examples being *endlessly*, *in a minute*, and *suddenly*. But strangely, there do not appear to be any “stative” adverbs. For a neo-Davidsonian, this accidental lexical gap – the SAG – is somewhat surprising, considering the central role that the state–event contrast plays in the verbal domain (see Dowty 1979; Hinrichs 1985; Katz 1995). To understand how surprising it is, however, we have to take a look at the nature of verb–adverb selection.

### 3. Verb-adverb selection and the Stative Adverb Gap

Verb–adverb selection is a complex phenomenon (Jackendoff 1972; Rochette 1990). It is clear that certain adverbs appear with some types of verbs but not with other types of verbs. This is illustrated by the pairs in (6)–(8).

- (6) a. *Austin tripped accidentally.*  
 b. ??*Austin wrote his book accidentally.*
- (7) a. *Melanie talked endlessly.*  
 b. ??*Melanie finished her book endlessly.*
- (8) a. *Steve finished his book quickly.*  
 b. ??*Steve slept quickly.*

Intuitively, the kind of infelicity evident in (6b), (7b) and (8b) seems to be tied to an incompatibility between the verbal and adverbial meanings. In (6b), for example, there seems to be a conflict between the fundamental intentionality of book-writing and the meaning of the adverb *accidentally*.

The neo-Davidsonian approach, of course, gives us a way of making this intuition precise. Since both verbs and adverbs are interpreted as predicates of eventualities, infelicity can be seen as resulting from the attempt to apply two incompatible predicates to the same eventuality. Verb–adverb selection,

then, is essentially the same phenomenon as the kind of classical verb–noun selection illustrated in (9) (Chomsky 1965; Katz and Fodor 1964).

- (9) a. ??*My shirt wants to go home.*  
 b. ??*His thoughts were very tall.*

In (9a) it is the incompatibility of the verb with the subject noun that gives rise to the infelicity (shirts just do not have desires). This rather general phenomenon might be cast as a violation of Grice’s (1975) Maxim of Informativeness. It is simply uninformative to claim that two incompatible predicates hold of the same object (since such a claim could never be true). Note that when selectional restrictions are violated, speakers often attempt to reinterpret the sentence so as to “save” the utterance. In the case of (9b), a hearer might reinterpret the word *tall* as meaning something like *important*. This type of reinterpretation is also evident in the case of verb–adverb selection. In (6b), for example, we might reinterpret *accidentally* to mean something like *effortlessly and quickly*.

At first glance it would seem that an account of the SAG that appeals to verb–adverb selectional restriction would be straightforward. Those adverbs that do not appear with state verbs simply happen to select for dynamic or agentive properties of an eventuality. The infelicity of (10), then, would be simply another example of the same kind of verb–adverb selection we saw at work in (6)–(8).

- (10) ??*Peter knew Mary gently.*

This seems correct. (10) is odd because *gently*, being a manner of action adverb, holds of an eventuality if and only if the manner in which the eventuality was acted out was gentle. *Know*, being a state predicate, does not have manners of being acted out, and so it is not possible for *gently* and *know* to apply to the same eventuality.

The problem is that this does not explain the Stative Adverb Gap. It explains why there are adverbs that combine with eventive verbs but not with stative verbs, but not why there are no adverbs that combine with stative verbs and not eventive verbs. In fact, we are left to wonder why such adverbs are not more common, since such lexical gaps are not at all characteristic of selectional restrictions. Typically, selectional restrictions are symmetrical. That is, if P and Q are incompatible predicates, we can usually find a P' and a Q' such that both P and Q' and P' and Q are compatible. Consider the case of (9b). Here P is *being a thought* and Q is *being tall*. These predicates are incompatible. But of course we can find both a P' and a Q'

that result in acceptable variants, namely *being a mountain* and *being confused*:

- (11) a. *The mountain is tall.*  
 b. *My thoughts are confused.*

In fact, there is good reason to expect selectional restrictions to exhibit this kind of symmetry. Selectional restrictions reflect the semantic compatibility between predicates of different syntactic category (compatibility between nouns and verbs or verbs and adverbs). Since the kind of compatibility we are concerned with here is purely “real world” compatibility, and there is no *a priori* association of classes of real world meanings with syntactic categories, we expect that the classes of compatible (and incompatible) predicates should be distributed relatively evenly among the syntactic categories. In syntactic contexts in which the semantic rule for combination is conjunctive, selection restrictions will, by necessity, exhibit paradigmatic symmetry.

And it is paradigmatic symmetry, of course, that is missing in the case of adverbial selection of stative verbs. We have *kiss gently* and *\*know gently*, but we don’t have *know ADV* and *\*kiss ADV*. Interestingly, as we have seen, if we leave stative verbs aside, other cases of verb–adverb selection do exhibit paradigmatic symmetry. That is, we find such paradigms as (12).

- (12) a. *??John slept quickly.*  
 b. *John ran quickly.*  
 c. *John slept deeply.*  
 d. *??John ran deeply.*

The fact that adverbial modification of stative verbs does not exhibit paradigmatic symmetry suggests that the SAG is not a matter of arbitrary semantic selection, but rather reflects a fundamental distinction between the way adverbs combine with stative verbs and the way they combine with eventive verbs.

Note that it is not enough to say that events simply have more properties than states do and are, therefore, compatible with more adverbs. This does not rule out there being a small set of adverbs that are compatible with state predicates but not event predicates. What we need to understand is why the set of adverbs that are compatible with state predicates (however small that set may be) is a subset of the set of adverbs that are compatible with event predicates. One oft-expressed intuition is that events are highly articulated entities of which states are the most simple form. In the next section, I give

this intuition formal expression and show how the formal mechanism proposed accounts for the Stative Adverb Gap.

#### 4. Accounting for the Stative Adverb Gap

In Davidson's (1967) paper on adverbial modification he suggests that "fact" verbs be distinguished from eventive verbs in terms of their argument structure. Davidson's tentative suggestion has been adopted by a number of researchers and pushed into service to account for some of the more well-known state/event contrasts (see Galton 1984; Löbner 1988; Sandström 1993; Katz 1995). The basic idea is that stative verbs are distinguished from eventive verbs by the absence of a Davidsonian argument. The state sentence (13a) and the event sentence (13b), then, have different logical representation, as indicated in (14).

- (13) a. *Sandy kissed Kim.*  
b. *Sandy liked Kim.*

- (14) a.  $\exists e$  [kiss (e,Sandy,Kim)]  
b. like (Sandy,Kim)

On this approach, the transitive stative verb *like* is of a different logical type than is the transitive eventive verb *kiss*. *Kiss* has three arguments – one of them an underlying eventuality argument – and *like* has only two. It is important to note that once existential closure has applied to an event sentence, it is of the same logical type as a state sentence. This is the sense in which event sentences are more articulated, but of the same sort as state sentences, and it is the central assumption of the theory. We might call any theory which adopts this assumption a "classical Davidsonian" theory. Such theories can be formalized in many ways, depending on what the particular analysis of state sentences and event sentences is. In the next section, I sketch one formulation.

##### 4.1. Classical Davidsonianism

Let me start by describing the structures that are shared by event sentences and state sentences. Since both state sentences and event sentences have temporal components to their semantics, I assume that both saturated state verbs and saturated event verbs are predicates of times. Tenses will apply to

these time predicates to yield propositional meanings. The difference between state sentences and non-state sentences, then, shows up “below” the tenses and “above” the VP. Following Klein (1994), Kratzer (1998), and others, I assume the existence of two aspectual operators that turn predicates of events (event verbs plus their nominal arguments) into predicates of times. These are the operators PERFECTIVE and PROGRESSIVE. If we make the further natural assumption that these operators are syntactic heads, the semantic contrast between state sentences and event sentences is reflected in the syntax, as illustrated in (15):

- (15) a.  $[_{TP} \text{Sandy}_I [_T \text{PAST} [_{AspP} \text{PERFECTIVE} [_{VP} t_1 \text{kiss Kim} ]]]]$   
 b.  $[_{TP} \text{Sandy}_I [_T \text{PAST} [_{VP} t_1 \text{like Kim} ]]]]$

Note that there is a mismatch between syntactic category and semantic type in the lexical vocabulary since stative VPs and non-stative VPs are of different type. Stative VPs and eventive AspPs, however, share a semantic type: they are properties of times

Logical forms will be interpreted with respect to a structure  $\langle D, E, T, <, \text{time-of} \rangle$ , where  $D$  is the domain of individuals, among which  $E$  is the subset of events,  $T$  is the set of time intervals with ordering relation  $<$ . The function **time-of** takes an event and returns its run time (this is Krifka’s (1989)  $\tau$  function). The difference between the eventive *kiss* and the stative *like* is reflected in their lexical entries, as indicated in (16).

- (16) *Kim*;  $k$   
*Sandy*;  $s$   
*kiss*;  $\lambda y \lambda x \lambda e [\text{kiss}(e,x,y)]$   
*like*;  $\lambda y \lambda x \lambda t [\text{like}(t,x,y)]$

The functional heads are interpreted as in (17):<sup>1</sup>

- (17) PAST;  $\lambda P \exists t [t < \text{now} \ \& \ P(t)]$   
 PERFECTIVE;  $\lambda t \exists e [P(e) \ \& \ \text{time-of}(e) \subset t]$   
 PROGRESSIVE;  $\lambda t \exists e [P(e) \ \& \ t \subset \text{time-of}(e)]$

Assuming that semantic combination is simple functional application we can, using the lexicon above, derive logical analyses for (15a) and (15b). These are given in (18) and (19). (Note that the first order variable  $t$  ranges over times, the variable  $e$  over events and the other variables over normal individuals.)

- (18) a. *Sandy kissed Kim.*  
 b.  $[\text{TP Sandy}_1 [\text{T PAST} [\text{AspP PERFECTIVE} [\text{VP } t_1 \text{ kiss Kim } ]]]]$   
 c.  $\exists t \exists e [\text{kiss}(e, \text{Sandy}, \text{Kim}) \ \& \ \text{time-of}(e) \subset t \ \& \ t < \text{now}]$
- (19) a. *Sandy liked Kim.*  
 b.  $[\text{TP Sandy}_1 [\text{T PAST} [\text{VP } t_1 \text{ like Kim } ]]]]$   
 c.  $\exists t [\text{like}(t, \text{Sandy}, \text{Kim}) \ \& \ t < \text{now}]$

We have, of course, simplified many of the less relevant issues. Nevertheless it should be clear that we get essentially what we want: the claim, on the one hand, that there is a past time at which a kissing of Kim by Sandy occurred, and, on the other hand, the claim that there was a past time at which Kim liked Sandy.

While a general discussion of the empirical advantages of this formulation of the classical Davidsonian approach would take us too far afield here (see Katz 1997, 2000), note that a number of features of the tense-aspect system of English follow from it. Consider, for example, the English progressive. If we make the natural assumption that the progressive form is the morphological expression of the operator PROGRESSIVE defined above, we can explain some of the most obvious distributional properties that it exhibits. Like PERFECTIVE, PROGRESSIVE is a function from event predicates to time predicates. Intuitively, it takes an event predicate and returns a predicate of times at which the event is going on.<sup>2</sup> Since it is, effectively, a type shifter, the progressive should not be able to apply either to its own output or to stative VPs since each of these is of the wrong type to act as ‘input’. This, of course, is exactly what we find to be the case:

- (20) a. *\*John is owning a car.*  
 b. *\*John is being kissing Mary.*

Furthermore, the well-known “stativizing” effect of the progressive (Vlach 1981) also receives straightforward expression since, formally, the function PROGRESSIVE is a stativizing operator in that it turns predicates of events into predicates of times. We might note, in this context, that many of the more recently proposed “sub-event” analyses of the English progressive (Landman 1992; Zucchi 1999) fail to account for the fact that progressive predicates behave like a stative predicate, making instead the prediction that a progressive should be a kind of activity.

## 4.2. A classical Davidsonian account of the SAG

Let us now look at how adverbs are to be treated. Like Thomason and Stalnaker (1973), I distinguish adverbs that apply to the propositional content – *probably, frankly* – from other adverbs. Furthermore, I distinguish temporal adverbials – *yesterday, for an hour, on Sunday* – from event adverb(ial)s – *slowly, gently* and the like. As would seem natural, temporal adverbials are taken to introduce underlying predicates of times and event adverbs to introduce underlying predicates of events. For concreteness, here are some examples:

- (21) *slowly*;  $\lambda P \lambda e [P(e) \ \& \ \text{slow}(e)]$   
*yesterday*;  $\lambda P \lambda t [P(t) \ \& \ \text{yesterday}(t)]$   
*probably*;  $\lambda P [\text{PROB } P]$

The intended interpretation of these translations is the following. When *slowly* applies to an event predicate, it returns a predicate of slow events of the same kind. When *yesterday* applies to a temporal predicate, it returns a predicate of times that were yesterday at which that predicate held. When *probably* applies to a proposition *P*, it returns a proposition that is true if it is probable that *P*.

The mechanism of adverbial modification adopted here is fairly simple. In contrast to syntax-based theories such as that of Cinque (1999), I follow Wyner (1998) and Ernst (2002) in assuming that the relative order of adverbials follows from principles of semantic composition (see also Frey, this volume). In short, adverbials adjoin freely to elements of the extended verbal projection, subject only to semantic compatibility constraints. For example, S-adverbials apply to propositional meanings (and therefore adjoin quite high, say to the TP projection), while temporal adverbs are properties of times, and so adjoin either to AspP or to stative VPs. Given a sentence such as (22a), which contains both a temporal adverb and an event adverb, the order of semantic combination is strictly determined, as indicated by the LF in (22b).

- (22) a. *John left slowly yesterday.*  
 b.  $[_{TP} \text{John}_1 [_T \text{PAST} [_{AspP} \text{PERFECTIVE} [_{VP} t_1 \text{left slowly}] \text{yesterday}]]]$   
 c.  $\exists t [t < \text{now} \ \& \ \text{yesterday}(t) \ \& \ \exists e [\text{time-of}(e)t \ \& \ \text{leave}(e, \text{John}) \ \& \ \text{slow}(e)]]]$

The event adverb combines with the event predicate, then an aspectual operator applies, then the temporal adverb combines with the resulting time

predicate, and finally a tense operator applies. It should be clear that type-theoretical restrictions rule out any other order of application.

At this point, it is easy to see that, like the prohibition on stative progressives, the Stative Adverb Gap is a direct consequence of the classical Davidsonian theory of verbal meaning. Since adverbs such as *slowly* are underlyingly properties of events, it is clear that they cannot apply to stative VPs (which we have interpreted as properties of times). This is not fundamentally different from the neo-Davidsonian claim that *slowly*, being a predicate of events, cannot apply to states. However, since on the classical Davidsonian theory an eventive predicate with an existentially closed event argument is of the same semantic type as a stative predicate, any adverb that can modify the latter must also be able to modify the former. To apply to a stative VP, then, an adverb must be of the same type as *yesterday* – it must be able to apply to properties of times. But if it is of this type then it can also apply to eventive AspPs as well. Thus it follows that there are no adverbs that can modify state verbs but not event verbs. The SAG is simply a consequence of the structure of the semantic combinatorial mechanism.<sup>3</sup>

#### 4.3. *Still* and *no longer*

In fact, however, there are two adverbs that appear only with stative verbs. These are *still* and *no longer*, when used in their temporal senses.<sup>4</sup> It is quite clear, as the contrasts between (23a–b) and (24a–d) illustrate, that these adverbs are infelicitous when they combine with (perfectively interpreted) event verbs:

- (23) a. \**John kissed Mary no longer.*  
 b. \**John still wrote a book.*
- (24) a. *John no longer owned a car.*  
 b. *John was still sick.*  
 c. *John was still kissing Mary.*  
 d. *John no longer worked in Stuttgart.*

Note that these adverbs combine both with lexical stative verbs such as *own* as well as with derived statives such as the progressive in (24c) and the generic in (24d).

The existence of these two adverbs might at first seem to call into question not only the theory just proposed, but also the claim that there is a Stative Adverb Gap to begin with, since these would appear to be stative ad-

verbs. As we will see, however, this is misleading. On the relevant reading, *still* and *no longer* are temporal adverbials (like *yesterday*). Our question is simply why these temporal adverbs do not seem to combine with eventive AspPs headed by the PERFECTIVE operator. I would like to suggest that this is a case of selectional restriction in the domain of temporal predicates. That is, while *still* and *no longer* can, in principle, combine with any sort of temporal predicate, their selectional properties restrict them from combining with perfective predicates. Just as there are event predicates that are semantically incompatible with one another – *sleep* and *quickly* being examples – so too, I am suggesting, are there predicates of times that are semantically incompatible with one another.

In fact, semantic selection in the temporal domain is a well-known phenomenon: The classic cases of *in an hour* and *for an hour*, which select for different classes of temporal predicates, are probably the most familiar examples:

- (25) a. *Peter ran the race in an hour.*  
 b. \**Peter owned a vacation house in the Alps in an hour.*
- (26) a. ??*Peter ran the race for an hour.*  
 b. *Peter owned a vacation house in the Alps for an hour.*

Although both are temporal adverbials, *in an hour* is compatible with accomplishment predicates but not with stative predicates or activity predicates, while *for an hour* is compatible with stative predicates and activity predicates but not accomplishment verbs. While the literature on this topic is extensive and varied (Dowty 1979; Hinrichs 1985; Krifka 1989; Moltmann 1991; Zucchi and White 2001), there is general agreement that the selection illustrated in (25) and (26) is due to purely temporal properties of the modifiers and the predicates they modify.

The question, then, is what it is about the lexical semantics of *still* and *no longer* that prohibits their combination with perfective event predicates. Intuitively, *still P* entails that *P* is true at time *t* and presupposes that *P* was true at some salient time *t'* before *t* and that *P* has been true at all the times in between *t* and *t'*. This is formalized in (27).

- (27) *still*;  $\lambda P \lambda t [P(t) \ \& \ \exists t' [t' < t \ \& \ P(t') \ \& \ \forall t'' [t' < t'' < t \rightarrow P(t'')]]]$

(For simplicity I have conjoined the presupposition and existentially quantified over the time *t'*.) The sentence *John is still sick*, then, entails that John is now sick and presupposes that John was sick at some past time *t'* and that

John has been sick since *t'*. Given this basic analysis we can see quite clearly why *still* selects for state verbs: *still* can only apply to predicates that hold of contiguous moments of times. This property (close to being the sub-interval property) is one that stative predicates have but that perfective eventive predicates lack. This follows from the semantics of the PERFECTIVE operator given above. Perfective AspPs hold of times that properly include the run time of an event, and since events are always extended, these times must be extended intervals. This means that perfective AspPs can never denote predicates that hold of contiguous moments of time. In essence, the contrast is attributed to the same semantic source to which Iatridou, Anagnostopoulou, and Izvorski (2000) attribute the contrast between (28a) and (28b), on the universal reading of *since Friday*.

- (28) a. *John has written a book since Friday.*  
 b. *John has been sick since Friday.*

In both cases, universal quantification over times rules out non-stative predicates. The semantics of *no longer*, being essentially *not still* (Krifka 2000), give it the same set of set of selectional restrictions as *still*, the negation being internal to the quantifier.

Both *still* and *no longer* simply happen to select for temporal properties that no perfective AspP has, but which all stative VPs do have. Their existence thus does not undermine the claim that there is a SAG or the classical Davidsonian account of it. There is, however, another class of adverbs that does raise questions for the analysis. These are the stative “manner” adverbs discussed in the next section.

## 5. Stative “manner” adverbs

Given the above account, it would be expected that stative verbs should only be modified by temporal and propositional adverbs. This, however, is clearly not the case. There are a number of adverbs that combine felicitously with stative verbs, but which would not normally be classified as temporal or propositional. Examples are given in (29).

- (29) a. *Peter knew Maria well.*  
 b. *Lisa firmly believed that James was innocent.*  
 c. *Mary loves Max passionately.*

These adverbs are not, of course, exceptions to the SAG, as they all combine with eventive verbs as well:

- (30) a. *Peter played the song well.*  
 b. *Lisa held the door firmly.*  
 c. *Mary kissed Max passionately.*

When they combine with event verbs, such adverbs are naturally taken to be event predicates, in the typical Davidsonian fashion. It might seem natural, then, to assume that when they combine with state verbs they are interpreted in a parallel fashion as predicates of underlying states. This is typically how neo-Davidsonian theories (e.g. Parsons 1990) treat the modifiers in (29).

There are two differences between manner modification of event verbs, of the sort exhibited in (30), and “manner” modification of state verbs, as illustrated in (29), that lead me to doubt that a parallel account is really called for. First, adverbs that function as “manner” modifiers of state verbs are lexically selected in a rather strict sense: *passionately* combines with *love*, and *well* with *know*, but not the other way around, and neither of these adverbs combines with *own*. There is little lexical selection in the case of event verb modification, however: *passionately* and *well* combine with *speak*, *kiss*, and even *eat*. Secondly, when these adverbs modify state verbs, they appear to be interpreted primarily as something like degree modifiers. The adverbs in (29a–c) seem to tell us something about the degree of knowledge, belief, or love being attributed to the subject. In the case of event verbs, however, these adverbs clearly express something about the manner in which the action is being carried out.

These facts point in the direction of a solution. Parsons (1990: 121–122) argues that degree modifiers such as *partway* should be treated as predicate modifiers and not as event predicates. His logical analysis of (31a) is something like (31b).

- (31) a. *Max filled the tank partway.*  
 b.  $\exists e$  [partway(fill)(e,Max,the-tank)]

The modifier *partway* applies to the eventive predicate *fill* to form a new eventive predicate. Rather than being co-predicates of an event, these degree modifiers apply to the verbal predicate directly and indicate the degree to which the underlying event is of the type described by the verb. In (31a) the claim being made is that there was an event of which Max was the agent that was a partial tank filling. For stative verbs, we therefore might adopt a parallel analysis. Here, however, we treat “manner” modifiers of stative

verbs as predicate modifiers. In (29a) *well* applies directly to *know* as indicated in (32).

(32) well(known)(Mary,French)

This analysis suggests a reason for the close lexical selection between verb and adverb noted above. It might be that these modified predicates are formed not in the syntax but in the lexicon. That is, we might treat “manner” modified state verbs as “phrasal idioms” of a sort. On a theory such as that of Marantz (1999), the phrase LOVE PASSIONATE would enter the derivation as a unit and acquire its appropriate categorial status syntactically.

We should note that the issues raised by “manner” modification of stative verbs reflect a general weakness of any Davidsonian treatment of adverbial modification. The issue is, as discussed extensively by Geuder (2000), that many VP-adverbs are simply not interpreted as applying to the event described by the verb. This can be most clearly seen in the example of such adverbs as *hungrily* or *temporarily*. In (33a), it is not the devouring event that is hungry, but rather the lion. In (33b), it is not the departure that is temporary, but rather Peter’s absence from the university.

- (33) a. *The lion devoured the deer hungrily.*  
 b. *Peter left the university temporarily.*

These adverbs appear to relate not directly to the event described by the verb at all, but to some other related entity. Whether their semantic representations reflect this, of course, is another question. Does (33a) have a logical representation in which the adjunct *hungry* applies to the subject NP directly, or is this a lexical entailment associated with *hungrily* that tells us that when an event is hungry we should infer that the agent of the event is?

“Manner” modifiers of state verbs can be seen in this light as well: they appear to characterize not so much the state described by the verb but events associated with this state. The claim being made in (29c), for example, seems to be that the various events associated with Mary’s love for Max (including the psychological events) were passionate. It seems, in fact, that the degree to which we would say Mary loves Max is correlated with the passion with which these events are engaged in. Turning these comments into a full-fledged account of degree-modification-as-indirect-event-predication is a task we will leave for future investigation, however. It should, nevertheless, be noted that it is not clear that the fact that *loving*

*passionately* is ‘engaging in passionate events related to loving’ is indeed a fact that is reflected in the semantic representation. Here, as well, it may simply be a lexical entailment associated with particular forms of predicate modification. While it would be quite interesting if the more specific indirect event modification analysis were correct, it should be clear that this is merely a more refined and better articulated form of the predicate modifier account. Whether it is the correct account I do not know.

## 5. Conclusion

In summary, I have claimed that there is a missing class of adverbs, namely adverbs that select only for state verbs, whose non-existence is not accounted for in the literature. I have further argued that this Stative Adverb Gap (SAG) is not plausibly accounted for on the basis of verb–adverb selectional restrictions and have suggested that the gap is far too systematic to be accidental. The central claim of the paper is that the SAG arises from the structure of the theory of sentence interpretation. I have here laid out the bare bones of a particular theory, which I called the classical Davidsonian theory, in which the event/state contrast is analyzed in terms of the presence or absence of an underlying eventuality argument. Further, adopting a semantic theory of adverbial modification, I showed how the SAG follows from the classical Davidsonian assumptions. Somewhat surprisingly, the potential counterexamples *still* and *no longer* were actually shown to vindicate the line of argument taken in the paper. Finally, we were perplexed by the existence of adverbs that behave much as we might expect adverbial predicates of underlying states to behave. I have suggested that this is due to their being an instance of lexical predicate modification. Whether this can be made to work, and how this influences the analysis of eventive modification, is left as an open question.

## Notes

- \* The ideas developed here were presented in preliminary form at the University of Stuttgart, the Hebrew University in Jerusalem, the 1999 meeting of the North-East Linguistics Society at Rutgers University as well as the Oslo Workshop on Adjuncts. I would like to thank Artemis Alexiadou, Adam Wyner, Arnim von Stechow, Hans Kamp, Edit Doron, Susan Rothstein, and Ingebjørg Tonne for helpful comments. Thanks also to the organizers of the Oslo Workshop for providing such an exceptional venue in which to discuss these issues.

1. This semantics of PROGRESSIVE should, of course, be modalized (Dowty 1979; Landman 1992).
2. The English progressive has a number of different uses, of course, including one in which the progressive is combined with a stative verb to give a “temporary” meaning, as illustrated by such sentences as *Peter is living in DC* and the “becoming” progressive of *Peter is resembling his father more and more these days*. Although Zucchi (1998) has attempted to relate some of these “progressive statives” to the core use of the progressive, it is not clear how closely they are related.
3. Note that this prediction is independent of the particular implementation of the classical Davidsonian analysis presented here. The only crucial point is that whatever event predicates denote and whatever state predicates denote, in the course of the derivation event predicates are transformed into something of the same type as state predicates.
4. We need to distinguish the temporal interpretation of *still* from its modal interpretation, in which it means something like *despite that*, as in: *There was an avalanche, but John still reached the top*. The relationship between these is taken up by Krifka (2000).

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