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THE PROGRESSIVE

The classical wisdom concerning the progressive aspect is something like the following: *Mary is building a house* describes a certain event, Mary's building of a house. The function of the progressive aspect, *-ing* is to present a certain perspective on this event: it presents an internal perspective on it, meaning that the event of Mary's building of a house is presented as perceived from the inside as an incomplete event, an event in progress.

I call this the classical wisdom, rather than the classical analysis, because as such it isn't much of an analysis. The classical wisdom basically tells us that the progressive sentence *Mary is running* is true iff Mary's running is in progress. As long as we don't know what it means for Mary's running to be in progress, we don't have an analysis of the progressive but merely a reformulation of it in a language of events.

Practically all current analyses of the progressive take the classical wisdom as a starting point and try, in one way or other, to give more content to this notion of incomplete event, event in progress. And practically all have, in my view, some interesting ideas to contribute.

In the first part of this paper I will discuss some of these analyses with the aim of sorting out a set of problems that are to some extent diagnostic for what ingredients an adequate analysis of the progressive should contain. As will become clear, these problems pull in different directions, and dealing with all of them is a bit like trying to perform a juggling act while sailing between Scylla and Charybdis. Nevertheless, in the second part I will try to develop an analysis that deals with these problems and that in some sense tries to combine the insights of previous analyses.

1. THE PROBLEMS

1.1. *The Imperfective Paradox*

The imperfective paradox is the observation that for verb phrases expressing activities, like *push a cart*, the inference from the past progressive to the simple past is valid, while for accomplishments, like *draw a circle*, it is not, i.e., (1) entails (2), but (3) does not entail (4):

(1)   Mary was pushing a cart.

(2)   Mary pushed a cart.

(3)   Mary was drawing a circle.

(4)   Mary drew a circle.

The intuitive reason for this is clear: (1) and (3) are true if some pushing of a cart/drawing of a circle was going on in the past. This pushing of the cart in the past in (1) is sufficient to make (2) true, but the drawing in (3) is not sufficient to make (4) true, because Mary may have been interrupted before she came even close to having drawn a circle.

The imperfective paradox obviously puts constraints on a semantic analysis of the progressive. For instance, consider Bennett and Partee's (1972) well-known analysis in terms of interval semantics:

> *Mary is building a house* is true at an interval iff that interval is a subinterval of a larger, later ending interval where *Mary build a house* is true.

Though Bennett and Partee's analysis does not make use of events, we can describe the intuition that forms the basis of this analysis as: Mary's building of a house is in progress at a certain period iff it will continue beyond this period and eventually be fully realized.

Though this idea of "continuation beyond the relevant interval" seems plausible as part of the analysis of the progressive, it can't exhaust that analysis. Bennett and Partee predict that in a situation where Mary is not drawing a circle now (and where she hasn't stopped right now), if (3) is true, (4) is true as well. With the standard analysis for the past, (3) is true if some interval in the past is surrounded by a larger and later ending interval where *Mary draw a circle* is true; by the situational assumptions, that interval itself has to be past, and it makes (4) true. This is, of course, not correct: Mary can easily have been interrupted half-way through; then (3) is true, but (4) is false.

Dowty (1979) assumes, with Bennett and Partee, that an event being in progress at a certain period does indeed mean that it will continue beyond that period. (As for Bennett and Partee, though I formulate the intuitive content of Dowty's analysis in terms of events, his actual analysis does not use events, but only intervals.) The difference is that Dowty assumes that this "will continue" is a *modal* notion.

Dealing with the imperfective paradox is a major aim of Dowty, and hence he obviously realizes that Mary's building of a house can be in

progress at some interval in this world, even though it gets interrupted and does not actually continue in this world. This is not a problem for Dowty, because his analysis does not require that it continues in the actual world, but only that it continues in some other worlds closely related to the actual world: the *inertia worlds* for the actual world.

The inertia worlds bring into the analysis of the progressive a notion of *normality*. These worlds are to be understood in the following way: the inertia worlds for our world at an interval are identical to our world up to that interval. From there on they are the worlds in which nothing unexpected happens, in which everything takes its natural, normal course. In the real world unexpected, surprising things may happen. The inertia worlds are those worlds that are like the real world up to some moment, but where after that moment these surprising things do not happen.

Dowty's analysis of the progressive is as follows:

> *Mary is building a house* is true in a world *w* at an interval *i* iff in every inertia world *v* for *w* at *i* this interval *i* is a subinterval of a larger interval where *Mary build a house* is true.

Thus Mary's building of a house is in progress at a period, according to Dowty, if this event will continue beyond that interval and be fully realized eventually in the inertia worlds. With some caution, we can paraphrase Dowty's analysis as follows: *Mary is building a house* is true at an interval iff under normal circumstances there would be a larger interval where *Mary build a house* is true.

Crucially then, Dowty's analysis of the progressive allows for the possibility that an event is in progress at a certain period and yet is interrupted in the real world, if this interruption does not represent the normal, expected course of events. This aspect has been criticized, and I will take up that criticism later, but first let us see how Dowty deals with the imperfective paradox.

Dowty makes the correct predictions about the imperfective paradox by means of two independently motivated assumptions about the semantic differences between activities and accomplishments.

First, for activities, like *Mary push a cart*, Dowty assumes a downward closure postulate:

> Activity Postulate
> If *A* is an activity and *A* is true at interval *i* then *A* is true at every reasonably large subinterval of *i*.

This means that if Mary pushes a cart at *i*, then she pushes a cart at every reasonably large subinterval.

Second, Dowty assumes that accomplishments like *Mary draw a circle* consist semantically of an activity part (satisfying the activity postulate), the drawing, and a result part, the circle coming into existence. Dowty assumes the two are causally connected and gives the following representation for *Mary draw a circle*:

CAUSE [Mary draw, A circle comes into existence]

i.e., Mary's drawing causes a circle to come into existence. For our purposes, the details of Dowty's analysis of accomplishments are not that important, as long as it is understood that there is an activity and a result part and that if *Mary draw a circle* is true at an interval, this requires the drawing to go on throughout that interval, but it only requires there to be a circle at the very end of that interval.

Here is a sketch of the argument showing that (1) entails (2) but (3) does not entail (4):

Activities:

Suppose *Mary was pushing a cart* is true in w now.

Then *Mary be pushing a cart* is true in w at i, for some past i.

Then *Mary push a cart* is true in every inertia world v for w and i at some j surrounding i (by the semantics of the progressive).

Then, by the activity postulate, *Mary push a cart* is true in every inertia world v for w and i at i (because i is a subinterval of j).

But by definition, the inertia worlds for w at i are identical to w up to i. This means that if *Mary push a cart* is true in an inertia world for w at i, it is true in w at i. Thus, *Mary push a cart* is true in w at i. Then *Mary pushed a cart* is true in w now. Hence, (1) entails (2).

Accomplishments:

By the same argument, *Mary was drawing a circle* entails *Mary drew*: the accomplishment consists of an activity part and a result part, and the activity postulate applies to the activity part just as above. But the result part, the circle coming into existence, is only required to take place in the inertia worlds at the bigger interval, i.e., typically later than the interval at which the progressive is evaluated. Since there is obviously no requirement that the result part should hold at subintervals and since the inertia worlds can differ from the real world after the interval of evaluation, it does not follow that a circle comes into existence in the real world. Hence, (3) does not entail (4).

We can assess the importance of the imperfective paradox for the analysis of the progressive as follows. The fundamental assumption under-

lying the analyses discussed up to now is that the progressive (as an operation) is a relation between two events (or their corresponding intervals): an event in progress and a corresponding complete event. The imperfective paradox tells us that the progressive can be true without the corresponding complete event being fully realized in our world. Thus the complete event need not be an *actual* event.

Thus, if the semantics of the progressive makes reference to a complete event (or the interval at which it goes on), the imperfective paradox tells us that the progressive makes reference to *possible*, not necessarily actual events. Since expressions in the scope of the progressive (in particular the objects of transitive accomplishment verbs) refer to parts of such complete, not necessarily actual events, this means that the progressive creates an intensional context.

This, Dowty would argue, is of course precisely what the imperfective paradox shows: if Mary was drawing a circle, it does not follow that there is an actual circle that Mary was drawing.

1.2. *The Problems of Modality*

Does the semantics of the progressive make reference to a complete event? Does the progressive create an intensional context?

Parsons (1989, 1990) presents a semantics that answers the first question in the negative, and he argues that the second question should also be answered negatively.

Parsons assumes that the function of the progressive is *not* to relate a progressive event to a complete event, but (in the case of accomplishments) to turn a complete event into an incomplete, progressive event. Parsons assumes a framework of actual events and two basic aspectual relations between events and intervals: an event can *culminate* at an interval, meaning that it gets completed there, or an event can *hold* at an interval. For Parsons, the truth of a simple past accomplishment like (4) postulates an event that got completed at some past interval:

(4′) $\exists x[\text{Circle}(x) \land \exists e \exists i[i < now \land \text{Drawing}(e) \land \text{Agent}(e) = m$
$\land \text{Theme}(e) = x \land \text{Culminates}(e, i)]]$

The progressive changes the Culminate relation into the Hold relation; hence the truth of the past progressive in (3) does not postulate any complete event, any event culminating, but only an incomplete event, an event holding:

(3′) $\exists x[\text{Circle}(x) \land \exists e \exists i[i < now \land \text{Drawing}(e) \land \text{Agent}(e) = m$
$\land \text{Theme}(e) = x \land \text{Hold}(e, i)]]$

Parsons' theory can deal with the imperfective paradox. Since activities are represented with Hold rather than Culminate, Parsons predicts correctly that (1) entails (2) (in fact, (1) and (2) are equivalent) but (3) does not entail (4).

On Parsons' theory, the progressive does not involve any complete event and since its function is to tell of an actual event that it holds, does not create an intensional context. This is clearly visible in (3'): there is an actual circle and some actual event of drawing that circle holding (but not culminating) at some past interval.

Now this is, of course, precisely what Dowty claims is wrong. But Parsons has an interesting rebuttal. He accepts that the truth of the progressive (3') commits him to the existence of a circle. However, he claims this is not a problem if we allow *incomplete* actual objects in our ontology: (3') does commit us to the existence of a circle, but only an incomplete one.

Parsons justifies this move by pointing out two things. First, there obviously *are* incomplete things in our world. Second, and more importantly, language users are willing to call an incomplete house a house, an incomplete circle a circle, etc., even if it isn't much of a house, or much of a circle. To use Parsons' example, maybe strictly speaking, we wouldn't call the house that Jack London was building when he died a house, but the fact that we name it Jack London's house shows that we aren't usually speaking that strictly. If this is so, we need not bother about the fact that (3') entails the existence of a circle, because it can be an incomplete one.

Let me say right away that I think Parsons' observation that we often allow incomplete *P*s to count as *P*s is important and valid (though, as Parsons admits, the case seems to be stronger for houses than for circles). In fact, since this observation is not incompatible with any theory of the progressive that I know of, I will assume that any such theory (including my own) can rely on incomplete objects where needed.

We are faced with two questions: Does the progressive create an intensional context? and, Does the progressive present two events — an actual one in progress and a complete possible one — or does it only present an actual one in progress?

The above discussion suggests that these questions are related. I would not go as far as to say that each answer to the one question is conclusively linked to one of the answers to the other (that would be like saying that no other theory of the progressive is possible), but I do think that an answer to each of these questions is very suggestive as to the proper answer to the other.

Parsons presents one argument against the assumption that the seman-

tics of the progressive involves a complete possible event. Look at (5) and (6):

(5)   Mary was building a house.

(6)   Mary was building a house that she would finish.

On a theory like Dowty's the progressive in (5) is a modal operator, whose scope is *Mary build a house*. The interpretation of the latter tells you that there is a complete house-building by Mary. Because it is complete, Parsons assumes that this possible event involves a finished house. Thus (5), so to speak, expresses that there is a finished-house building *under the scope of* the progressive operator. The problem that Parsons raises is that this interpretation of the scope of the progressive in (5) is exactly the same as the interpretation of the scope of the progressive in (6), *Mary build a house that she would finish*, on the reading where the relative clause has scope under the progressive. This predicts then that (6) has a reading where it is equivalent to (5). However, (6) has no such reading. That suggests that the interpretation of (5) and (6) does not involve a complete event as the interpretation of the scope of the progressive.

I think that as presented, this argument misrepresents the claims of a theory like Dowty's. It is correct to say that the scope of the progressive in (5) on Dowty's theory involves a complete building of a house. It is incorrect to assume that this event requires the house to be finished. Dowty can use incomplete objects as much as Parsons does; hence he is only committed to the claim that the scope of the progressive involves a complete building of a — possibly unfinished — house. In Dowty's theory, the only requirement on an accomplishment event is that the result, that is, what makes the event complete, is part of it. But in a case like (5), the result is *not* that a house gets finished, but only that a house gets built, i.e., that as a result of building, something has come into existence that we can call a house.

However, Parsons could modify his argument as follows. Suppose we restrict ourselves to a context where we give *house* a very strict interpretation, only allowing finished houses as houses. In such a context, Parsons' argument holds up. Yet, even in such a context, (6) does not seem to have a reading equivalent to (5).

Even if we accept this conclusion, I do not think that Parsons' argument can possibly show what it purports to show. The reason is that exactly the same observation applies to examples (7) and (8):

(7)   Mary tried to find a unicorn.

(8)   Mary tried to find a unicorn that she would find.

Nobody would dispute that *try* creates an intensional context and that its scope in (7) is *(PRO) to find a unicorn*. Any theory of relative clauses would predict a reading of (8) where the relative clause has scope under *try*. On that reading, (8) is equivalent to (7), and here as well, I think, we can argue that (8) does not have such a reading.

Consequently, it is not correct to treat the non-existence of this reading as evidence that the progressive is not an intensional operator or that its scope in (5) is not the accomplishment sentence (or the accomplishment VP, Parsons' argument, if valid, applies equally to theories where the progressive is a VP-operator). Rather, it seems plausible to assume that one and the same pragmatic explanation can account for the lack of this reading in both cases: Do not use a relative clause if it's vacuous and the intended meaning can be expressed less confusingly without it.

I now want to argue that the progressive *does* create an intensional context.

We have seen that if we allow incomplete actual houses as actual houses, Parsons can maintain that examples like (5) are extensional, i.e., make reference to an actual house. We would have an argument that the progressive does create an intensional context if we can find the following: an accomplishment verb that is itself extensional (such that *Mary V-ed a P* entails *there is a P such that Mary V-ed it*), but where the progressive *Mary was V-ing a P* can be true without there being an actual *P*, complete or incomplete, that Mary was V-ing. In such a case we have to assume that the context indicated by *was V-ing* – is an intensional context, and since the verb is itself extensional, the intensionality can only be contributed by the progressive.

Such cases exist indeed. Note that the cases that Parsons discusses (like building a house) are typically cases where an object is created in stages; that is, there is a gradual process of creation that results — if we're lucky — in the establishment of a complete object. This object is not complete during the creation stages, but it is there as an incomplete object. The point that I want to make is that this gradualness is not a necessary aspect of processes of creation.

It is perfectly conceivable that a certain process of creation requires several stages that are necessary for the process (like saying magic formulas, and lots of smoke) but during which no object whatsoever exists, while at the end of the process the object comes into existence in a flash. Look at the following sentence:

(9)   God was creating a unicorn, when He changed his mind.

There is nothing incoherent about the assumption that the process (or this particular process) of creating a unicorn is indeed a process of the above form: a lot of preparatory work and at the end — flash — a unicorn. In this context, example (9) is perfectly okay: the process was interrupted before the flash, no unicorn was created.

The point is that in this situation we cannot claim that in (9) we quantify over an incomplete, an unfinished unicorn, because there is no such thing. If we were to claim that *was creating* in (9) does not create an intensional context, we would have to assume that our world, that is, the world of actual objects, is also populated with uncreated unicorns. However, I expect these to be the same entities that Mary was trying to find on a *de dicto* reading of (7).

The intensionality in (9) can only come from the progressive: *create* itself is not an intensional verb: *God created a unicorn* does commit us to the existence of an actual unicorn.

We find more evidence that the progressive creates an intensional context if we compare the anaphora possibilities of a progressive like (9) (under the assumptions given) with the anaphora possibilities in a standard intensional context.

(7)   Mary tried to find a unicorn.

      a. No unicorn was found.
      b. She would sell it to Sue.
      c. ?It was not found.

In (7), the (a) sentence is a perfect continuation, of course; the (b) sentence is also okay, but is a case of modal subordination (see Roberts 1987), a process of anaphoric reference in one intensional context to an antecedent in another intensional context; the (c) sentence, however, is not possible (on a *de dicto* reading of the first part).

We find exactly the same anaphora possibilities in (10): the (a) sentence is perfect; (b) is modal subordination; (c) is, in the situation given above, not possible:

(10)   God was creating a unicorn.

      a. No unicorn was created.
      b. He would give it to Eve.
      c. ?It was not created.

The above discussion, then, seems to provide more conclusive evidence that the progressive indeed creates an intensional context. Note that this is

not inconsistent with the fact that in many cases this intensionality will not show up. That is already to be expected on Dowty's analysis: we evaluate the scope of the progressive in inertia worlds, rather than in the real world. But with respect to the objects in them, inertia worlds usually don't differ from the real world. The lexical meaning of *push* tells us that if a process of pushing goes on in this world, the thing pushed is already there. Worlds where carts come into existence as a result of pushing are not likely candidates for "worlds where everything takes its normal course of events." It is safe to say that more often than not we don't see the intensionality of the progressive. But that doesn't mean it isn't there.

I conclude that the progressive does create an intensional context; hence any theory of the progressive will have to come to grips with its intensionality. As suggested earlier, this intensionality supports the view that, in the case of accomplishments, semantically the progressive relates an actual event in progress to a complete, possibly non-actual event (the accomplishment event).

1.3. *The Problem of Interruptions*

We will be concerned now with (11):

(11)   Mary was crossing the street.

On Dowty's analysis, (11) is true in our world if Mary manages to cross the street in the inertia worlds for our world, the worlds where everything takes its normal, unsurprising course of events. This analysis is very apt for dealing with examples like (12):

(12)   Mary was crossing the street, when a thunderbolt from heaven struck her down.

However, Vlach (1981) points out that Dowty's analysis runs into problems with examples like (13):

(13)   Mary was crossing the street, when the truck hit her.

The progressive is true, on Dowty's approach, if in all inertia worlds — all worlds in which nothing unexpected happens — Mary manages to cross. However, take the interval at which the truck is seconds away from Mary. (13) is true. Yet, the truck is there, and the truck is also there in all inertia worlds. If nothing unexpected happens, the truck will hit her; it would be a miracle for her to escape. Hence, Dowty incorrectly predicts that (13) is false at this interval.

We can express this in a different way. The inertia worlds are the

worlds in which nothing unexpected happens, in which everything takes its natural, expected course of events. That means, however, that in them, *both* Mary's crossing *and* the truck are following their natural course of events and this, unfortunately for Mary, normally ends in a collision.

In this subsection I will present three proposals for the semantics of the progressive that can deal with this problem.

The first proposal is a modification of Dowty's theory. As we saw, the problem with inertia worlds seems to be that *everything* is required to take its normal course of events in them. This directly suggests the following modification: we shouldn't require that in inertia worlds *everything* takes its normal course of events, but *only Mary's crossing* (and everything that doesn't interfere with that). We could capture this by introducing a notion of inertia world that is not only indexed for a world and an interval (as it is in Dowty's theory), but for an event as well:

> The set of inertia worlds for w at i for e is the set of all worlds identical to w up to i and from there on (possibly) differing from w in that in them, e is allowed to follow its natural course, without external interruptions.

Note, however, that this involves one major change with respect to Dowty's theory: we need to be able to refer explicitly to an event or a process, such as Mary's crossing. Thus, this semantics of the progressive has to use events (rather than just intervals).

Assume that we have a theory in which we can refer to events. Then we can modify Dowty's analysis as follows:

The Normality Proposal

> *Mary is crossing the street* is true in w at i iff some process of crossing by Mary, e, is going on in w at i and in every inertia world for w and e at i, i.e., in every world where e is allowed to follow its normal course, there is an interval surrounding i where *Mary cross the street* is true.

This analysis can deal with Vlach's problem. Although Mary's crossing is interrupted in the real world, it needn't be in those worlds where it is allowed to follow its normal course (in those worlds the truck, of course, won't be allowed to follow its normal course). So (13) can easily be true.

Vlach's own proposal is somewhat different. Though his proposal is not worked out in great detail and open to different interpretations, it seems clear that he denies that a notion of normality like Dowty's plays a role in the semantics of the progressive. Presenting an example like (13), Vlach argues (against Dowty) that the truck hitting Mary "is not an interruption

of the natural course of events, it is the natural course of events" (p. 286). What *is* interrupted is a process that, if continued, *would* eventually cause *Mary crossed the street* to be true. Vlach's proposal for the analysis of the progressive can be stated as follows:

Vlach's Proposal

> *Mary is crossing the street* is true in *w* at *i* iff there is a process going on in *w* at *i* such that if it were to continue, it would eventually cause *Mary cross the street* to become true.

If we take this proposal literally, it does not do any better at the problem of interruptions than Dowty's original proposal. Look at Mary in the intersection fifteen seconds before the truck hits her. Intuitively, (11) is true there. Yet, whatever is going on at that interval (15 second before the crash) does continue beyond that interval (up to the accident), and it doesn't eventually cause *Mary cross the street* to become true; so it's not the case that if it were to continue, it would cause the crossing to be completed. Vlach predicts that (11) is false.

The crucial observation to be made is that the subjunctive in Vlach's proposal should not apply at the interval of evaluation, but should be delayed till the interval where what is going on at the interval of evaluation is interrupted in our world. This way of making Vlach's proposal precise I call the subjunctive proposal:

The Subjunctive Proposal

> *Mary is crossing the street* is true in *w* at *i* iff there is a process going on in *w* at *i* such that if it were to continue beyond the interval where it stops in *w*, if would eventually cause *Mary cross the street* to become true.

On this proposal we can argue that if Mary is in the intersection fifteen seconds before the accident, (11) is true. Assuming a standard analysis of counterfactuals, say, the one in Stalnaker (1968), (11) is true if a process is going on in our world such that *at the interval where it is interrupted,* in the closest world where it is not interrupted *Mary cross the street* becomes true. It can plausibly be argued that this closest world at that interval does not have the truck at the same place in it and Mary gets to the other side; so indeed (11) is true.

Both the normality and the subjunctive proposal involve modality; hence, both can deal with the problem of modality as well as the problem of interruptions. I will discuss cases that distinguish between these proposals in the next subsection. Before doing so I will introduce yet another proposal.

Bach (1986) points out that we seem to find something like an imperfective paradox in the nominal domain as well when we look at the semantics of *part of.* Consider (14):

(14)   This is part of a Roman aqueduct.

As Bach points out, (14) does not entail that there is, or was, an actual Roman aqueduct that "this" is part of; this part may be all there ever was.

Of course, Parsons would claim that there is an actual aqueduct, namely an incomplete one. However, I think that speakers are quite permissive in what they allow actual things to be part of. To take an extreme case, one day I'll become an artist (well, or sorts) and show you my construction *La Condition Humaine,* and I'll tell you, "It's part of an Escher cube (see Escher's *Belvedere),* in fact it's as much of an Escher cube as can possibly be realized." I think this is possible and does not commit me to the existence of actual Escher cubes, only of actual parts of Escher cubes, but those clearly are not Escher cubes themselves.

One way of analyzing (14) is by adopting some form of situation semantics (Barwise and Perry 1983). Suppose we allow in our ontology besides actual entities also *types* of entities. That is, besides all actual Roman aqueducts, we allow an entity which is the type of Roman aqueducts. Furthermore, we assume a relation of *realization,* such that all actual Roman aqueducts (fully) realize the type of Roman aqueducts. Then we could define the following:

> *This is part of a Roman aqueduct* is true iff this (actual entity) partially realizes the type of Roman aqueducts.

Since not every actual stone is part of a Roman aqueduct, we would have to put some constraint on this kind of definition, like the following:

> x partially realizes type X iff x realizes sufficiently much of X.

This brings vagueness into the analysis of *part of* (when is sufficiently much realized?), but one could argue that it is precisely this kind of vagueness that we observe in sentences like (14).

Taking the analogy between the nominal and the verbal domain very seriously, we can then assume that the progressive is the realization in the verbal domain of this notion of *part of.* This leads to

The Part-of Proposal

> *Mary is crossing the street* is true iff some actual event realizes sufficiently much of the type of events of Mary's crossing the street.

Such a proposal can deal with the problem of modality, since something that partially realizes the event type of God's creating a unicorn need not necessarily realize the unicorn. Moreover, since no requirement of normality is built into the semantics, the problem of interruptions need not arise.

There are several proposals in the literature that have more or less this form, e.g., Hinrichs (1983), Cooper (1985), ter Meulen (1987), Link (1987).

1.4. *The Problem of Non-Interruptions*

It has generally been recognized (among others by Dowty) that the following inference pattern is valid both for activities and accomplishments; that is, the simple past entails the past progressive:

> (15)   If Mary *wrote* a book, then before this was completed, at least for some time leading up to the completion she *was writing* a book.

If we think of the accomplishment involved in *Mary wrote a book* as consisting of a development part, the writing, and a resultative part, then we can interpret (15) as expressing that if the accomplishment *Mary wrote a book* is true, the progressive is true during its development part.

This intuition seems to be very strong. Note that it doesn't depend on the past. (16) is as valid:

> (16)   If Mary will write a book, then she either is or will be writing a book.

Thus, if an accomplishment manages to get completed, it is unproblematic to assume (in retrospect) that the progressive is true during the development stage.

The problem with non-interruptions is that this is the case even if the event gets completed against all odds. This is a serious problem both for Dowty's original proposal and for the normality proposal that was given in the last subsection.

Look at example (17):

> (17)   Mary was crossing the Atlantic.

Let's consider first the following scenario: Mary gets into the water in France; she is not a very good swimmer; she swims for an hour, and sinks. On this scenario, (17) is clearly false. The second scenario is almost like the first, except that she doesn't sink but, through divine intervention,

actually manages to make it across the ocean. For this scenario, I think the intuitions are different. Now if you ask me (watching, say, a tape of Mary made after half an hour of swimming), "what was she doing there?" I could answer truthfully, "Well, I would never have believed it at the time, but in fact she was crossing the Atlantic Ocean." So on this scenario, (17) is true.

Let me put a warning here. I am only claiming that the answer that I give is a natural, possible answer to this question. What is important here is that if this answer is *possible*, as I think it is, the analysis of the progressive will have to explain its possibility. That is what I am concerned with in this subsection. I do not dispute that it is also possible to give a different reading of the facts. I will come back to this issue at the end of this paper.

The problem for Dowty's analysis and the normality proposal is the following: at the interval to which the question refers, the inertia worlds are such that Mary won't make it across in them; only a miracle can enable her to do so. In other words, in the inertia worlds for the swimming after half an hour, the swimming process continues in the normal, expected way and hence ends long before the ocean is crossed. So on the normality proposal, (17) is false at that interval both in the first and in the second scenario. The problem is that our world is sometimes a miracle world.

We have a situation here where in the inertia worlds the event gets interrupted, but in the real world it miraculously doesn't. In this case it is the real world — in which the process of swimming does not follow its normal, expected course of events — rather than the inertia worlds, that determines whether the progressive is true or not. But that strongly suggests that it is a mistake to make normality part of the semantics of the progressive.

The subjunctive proposal has a decisive advantage over the normality proposal with respect to this problem. On the subjunctive proposal, (17) is true at the interval after half an hour of swimming iff there is a process going on at that interval such that if that process were to continue beyond where it actually stops, it would eventually cause *Mary crossed the Atlantic* to become true. On the second scenario, the process does actually continue and does eventually cause *Mary crossed the Atlantic* to be true, before it stops; hence (17) is true on the second scenario. The fact that the process continues through the help of unexpected divine intervention is irrelevant for the truth of the progressive on the subjunctive proposal: it is sufficient that it in fact continues and gets completed; normality plays no role in this.

It can also be plausibly argued that on the subjunctive proposal, (17) is false on the first scenario, where there is no divine intervention and Mary

sinks. In the closest world where she doesn't sink, maybe she manages to do a couple more laps, but surely she doesn't get to the other side. So (17) is false.

The problem of non-interruptions is also a problem for the part-of proposal. On the part-of proposal, (17) is true iff some actual event partially realizes the type of events of Mary crossing the Atlantic. I argued before that "actual entity x partially realizes type X" cannot just mean 'x is part of a possible (or even impossible) complete entity of type X.' That would make any stone part of a Roman aqueduct, and in the case of the progressive it would mean that (17) would be predicted to be true on the first scenario: the actual event that is going on after half an hour is not part of any *actual* complete crossing, but it's surely part of some *possible* complete crossing. It's for this reason that the part-of proposal adds a sufficiency condition: we don't have to accept (17) as true if not sufficiently much of the event type is realized. Thus, we can argue that on the first scenario not sufficiently much of the type of Mary's crossing is realized and that for that reason, (17) is false.

The problem is that at the interval after half an hour *equally much* of the event type of Mary crossing the Atlantic is realized on *both* scenarios. At this interval there isn't yet a difference between the two scenarios. The only relevant difference between the two scenarios is that what is an actual event on the second scenario, Mary's crossing the Atlantic, is a non-actual event on the first scenario. But at the interval of evaluation equally much of that possible event is there in both scenarios; thus the progressive is true in both cases, or in neither. Hence, the part-of proposal cannot deal with the problem of non-interruptions.

There is a very simple way of making the part-of proposal immune to this objection. We could just admit that "sufficiently much" does not help us and replace it by a primitive notion S: (17) is false on the first scenario and true on the second because the event that partially realizes the type of Mary crossing the Atlantic has property S on the second, but not on the first scenario. (This is, I think, precisely what Parsons' approach to such cases would amount to: on the second scenario, Mary's crossing the Atlantic happens to have the (primitive) property Hold, while on the first it happens not to have the property Hold).

This would work, but it's very unsatisfactory. I don't see that such a proposal is better than saying that a complete event is in progress in the one case, but not in the other. Such a proposal is able to make (17) true in the one scenario and false in the other, but it does not try to explain why this is so.

If we do want to give content to property S, we should look at the

differences between scenario 1 and scenario 2. In scenario 2, the event that goes on has S. It continues and gets completed. In scenario 1, the event that goes on doesn't have S. It doesn't continue, and even if it were to continue where it actually stops, it would only continue a little bit and still end long before Mary manages to cross.

To this, we can add the case of Mary crossing the street when the truck hits her. In that case, the event that goes on does have S, it doesn't continue, but unlike scenario 1, it's plausible that if it were to continue, Mary would manage to cross.

These three cases together strongly suggest that S, the property that we need in order to allow the progressive to take different truth values on the different scenarios presented, is a modal, subjunctive property. In other words, we can understand the subjunctive proposal as giving content to this property S, and hence as giving content to the part-of proposal. Thus, we can maintain the parallel between the nominal and the verbal domain that Bach points out, as long as we realize that in the verbal domain a notion of 'partially realizes' has a modal, in fact subjunctive, aspect to its meaning.

1.5. *Problems of Continuation*

I will now discuss some problems with the subjunctive proposal. On this proposal (11), *Mary was crossing the street,* is true iff some event was going on such that if it had continued beyond where it actually stopped, it would eventually have led to the truth of *Mary cross the street.*

Let's change the situation a little bit. As before, Mary gets hit by the truck, but this time it's a big and busy street. In fact, there are two trucks in two lanes: the first truck is the one that hits Mary, the second one in the second lane drives one truck-length behind the first; both drivers and Mary are as careless and unattentive as ever. The problem is that in this situation, we can make a case that, intuitively, both (18) and (19) are true:

(18)   Mary was crossing the street, when the first truck hit her.

(19)   If the first truck hadn't hit her, the second truck would have.

But if (19) is true, then in the closest world where Mary's crossing does not stop at the interval where the first truck hits her, it stops shortly after when the second truck hits her, and her crossing does not get completed. So (18) is false on the subjunctive proposal.

As it is, the subjunctive says:

> If instead of stopping, the event had continued, the complete event would eventually have been realized.

This means:

> If whatever interrupted the event had not interrupted it, the
> complete event would eventually have been realized.

This gets rid of the first truck but not of the second, which leads to the
problem. It also suggests a solution. We might change the subjunctive as
follows:

> If *nothing* had interrupted the event, the completed event
> would eventually have been realized.

This is not very precise, but the idea is as follows: we don't just want to
look at what would have happened, had the event not been interrupted,
but at what would have happened, *had there been no danger of inter-
ruption*. In the closest world where there is no danger of interruption, both
trucks are removed and Mary gets to the other side of the street.

There are several problems with this. For one thing, we have to be very
careful about our interpretation. Take once more Mary's crossing the
Atlantic, in the scenario without divine intervention. If the progressive
instructs us, at the moment that she sinks, to go to the closest world where
there is no danger of the swimming being interrupted, won't that be a
world where in fact she will cross the Atlantic? That is, doesn't that make
(17) true on the first scenario?

There may be a way around this, but a more acute problem is the
following case, pointed out to me by Igal Kvart. Look at example (20):

(20)   Mary was wiping out the Roman army.

The situation is that Mary, a person of moderate physical capacities, is
battling the Roman army. She manages to kill a couple of soldiers before
she gets killed. (20) is clearly false in this situation.

Mary's wiping out of the Roman army gets interrupted by the soldier
that kills her. However, if we go to a world where we remove not just this
soldier but all danger of the event being interrupted, we remove, by the
nature of the event, the rest of the Roman army. Hence in that world,
Mary has indeed wiped out the Roman army, so (20) is predicted to be
true.

This example is tantalizing, because it suggests very strongly that some
form of normality is part of the semantics of the progressive after all. The
reason why (20) is false seems straightforward: because Mary didn't have
a chance in hell of succeeding. There's just too many of them and she's not
that strong. Only a miracle could make her succeed, and the problem is
that our world is usually not a miracle world.

It may be clear now why I called the analysis of the progressive a juggling act. Concerning interruptions, we have to make sure that (11), Mary's crossing the street, is true even if there are several trucks waiting in line to hit her, without making (20), Mary's wiping out the Roman army, true where there are several soldiers waiting in line to kill her, and without making (17), Mary's crossing the Atlantic, true in the first scenario, where there are several drowning events waiting to be realized. Furthermore, (20) strongly suggests that we should bring a notion of normality — or chance — back into the analysis of the progressive, because such a notion seems to be at the heart of the problem. But if we bring that in, how can we deal with (13), Mary crossing the street, where arguably, at the moment of collision Mary doesn't have a chance of crossing either? Furthermore, we have to make sure that (17), Mary crossing the Atlantic, can be true in the second scenario after half an hour of swimming, even though she doesn't have a reasonable chance (yet) of crossing there.

I will try to clean up this mess in the second part.

2. THE ANALYSIS

2.1. *The Framework*

I will assume a standard type-theoretic language with lambda abstraction enriched with a Neo-Davidsonian vocabulary, i.e., I will assume that we can quantify and abstract over events and intervals and that thematic relations are specified for events. I will only specify things that are non-standard here.

The models for the language are tuples $\langle D, E, I, W, t, R, F \rangle$ where

— D is a set of individuals; E is a set of events; I is a set of intervals (with standard relations like precedence and overlap); and W is a set of possible worlds.

— t, the temporal trace function (adapted from Link 1987), is a partial function from $E \times W$ into I: t assigns to an event e in a world w the interval $t(e, w)$ at which e goes on in w (if it goes on in w).

— R is a set of thematic roles, A (agent), T (theme), etc. Thematic roles are partial functions from events to individuals.

— F is the interpretation function for the language.

The semantics will specify for every expression α: $[\alpha]_{M, w, g}$, the extension

of α in M in world w relative to assignment function g. We do not have to evaluate relative to times, because we have those explicitly in the language.

I will make some special assumptions about the interpretation function F. I will assume that the extension of *nominal* predicates, like *house*, varies with worlds, but not with time. I assume here, with Enç (1981), that the extension of nouns is determined by context. This assumption is made for simplicity; nothing that I have to say in this paper depends on it. In set theoretic terms:

> F is a function from nominal predicates and worlds into sets of individuals: $F(\text{house}, w) \; \varepsilon \; \text{pow}(D)$
> $[\text{house}]_{w, g} = F(\text{house}, w)$
> $[\text{house}(x)]_{w, g} = 1$ iff $g(x) \; \varepsilon \; [\text{house}]_{w, g}$

The extension of *verbal* predicates, like *build*, on the other hand, does vary with respect to time as well.

> F is a function from verbal predicates and worlds and intervals to sets of events: $F(\text{build}, w, i) \; \varepsilon \; \text{pow}(E)$
> $[\text{build}]_{w, g} = \lambda i.F(\text{build}, w, i)$

Intuitively, *build* is interpreted in w as the function that assigns to every interval the building events that go on at that interval in w.

$$[\text{build}(e)]_{w, g} = 1 \text{ iff } g(e) \; \varepsilon \; [\text{build}]_{w, g} \, (t(g(e), w))$$

This means that

$$[\text{build}(e)]_{w, g} = 1 \text{ iff } g(e) \; \varepsilon \; F(\text{build}, w, t(g(e), w))$$

Intuitively: e is an event of building in w iff e is a building event that goes on in w at the interval $t(e, w)$.

We will have expressions in the language like: $t(e) < now$. In this expression, $t(e)$ has the following interpretation:

$$[t(e)]_{w, g} = t(g(e), w).$$

Thus $t(e) < now$ is true in w if the interval at which e goes on in w is in the past. I will assume that all other expressions, like $i < now$, $\text{Agent}(e) = x$, etc., are interpreted just as one would expect.

Finally there is one special relation: PROG. With the part-of proposal, I will assume that the progressive is a relation between events and event types, which I take to be sets of events. So PROG is a relation between events and sets of events.

Concerning the grammar, I will assume a type-shifting theory in which

verbs are always functions on all their arguments. If the types don't match, the verb is lifted to the type where it does take the correct argument (for exposition and references, see Landman 1991). I will specify the relevant rules by giving the derivation of *Mary was building a house*.

$$build \ \rightarrow \ \lambda y.\lambda x.\lambda e.\text{Build}(e) \ \wedge \ \text{Agent}(e) = x \ \wedge \ \text{Theme}(e) = y.$$

Transitive verbs are relations between their object, subject, and event argument.

$$a \ house \ \rightarrow \ \lambda P.\exists y[\text{House}(y) \ \wedge \ P(y)]$$

NPs get their usual interpretation.

In order to form the VP *build a house* we have to lift *build* to the correct type. X is a variable of type $\langle\langle e, t \rangle, t \rangle$:

$$build \ \rightarrow \ \lambda X.\lambda x.\lambda e.X(\lambda y.\text{Build}(e) \ \wedge \ A(e) = x \ \wedge \ T(e) = y)$$

Functional application and conversion give us:

$$build \ a \ house \ \rightarrow \ \lambda x.\lambda e.\exists y[\text{House}(y) \ \wedge \ \text{Build}(e) \ \wedge \ A(e) = x$$
$$\wedge \ T(e) = y]$$

I assume that the progressive is a VP-operator defined as follows:

$$\text{ing(VP)} \ \rightarrow \ \lambda x.\lambda e.\text{PROG}(e, \text{VP}(x))$$

Thus:

$$be \ building \ a \ house \ \rightarrow$$
$$\lambda x.\lambda e'.\text{PROG}(e', \lambda e.\exists y[\text{House}(y) \ \wedge \ \text{Build}(e) \ \wedge \ A(e) = x$$
$$\wedge \ T(e) = y])$$

I assume that tenses are VP-operators as well (but apply after aspect). I'll only give the simple past:

$$\text{past (VP)} \ \rightarrow \ \lambda x.\lambda e.t(e) \ < \ now \ \wedge \ (\text{VP}(x))(e)$$

Hence:

$$was \ building \ a \ house \ \rightarrow$$
$$\lambda x.\lambda e'.t(e') \ < \ now \ \wedge \ \text{PROG}(e', \lambda e.\exists y[\text{House}(y) \ \wedge$$
$$\text{Build}(e) \ \wedge \ A(e) = x \ \wedge \ T(e) = y])$$

$$Mary \ \rightarrow \ m$$

Mary can be interpreted at type e. Functional application and conversion will give:

Mary was building a house → $\lambda e'.t(e') < now \wedge$
$PROG(e', \lambda e.\exists y[House(y) \wedge Build(e) \wedge A(e) = m \wedge T(e) = y])$

With Parsons, I will assume that finally existential closure on the event argument gives:

$\exists e' [t(e') < now \wedge$
$PROG(e', \lambda e.\exists y[House(y) \wedge Build(e) \wedge A(e) = m$
$\wedge T(e) = y])]$

Thus, *Mary was building a house* is true in *w* iff some event is realized in *w* in the past and that event stands in the PROG relation to the type of events of Mary building a house. What is left to specify is what the PROG relation is.

2.2. *Event Stages*

I will assume that *E*, the set of events, is ordered by two relations: a relation of 'part-of' and a relation of 'stage-of' (both of them partial orders). Furthermore, I assume that a stage of an event is a special sort of part of that event.

'Part-of' is the relation that holds, for instance, between Hanny Schaft's acts of resistance and the Second World War. I will assume that if an event is a complete accomplishment event (Mary's building of a house), the result (the house being built) is part of that event.

The stage-of relation is related to Carlson's (1977) notion of stage. Carlson assumes an ontology of individuals and stages of individuals, where the latter are spatio-temporal realizations of individuals. In a given world, an individual can be realized at more than one interval; stages of individuals, on the other hand, are uniquely linked to intervals. In that sense, events in our theory are like Carlson's stages: the temporal trace function links an event in a world uniquely to an interval (if it does at all).

We can regard Carlson's stages as being ordered by relations like 'part-of' as well. The sense in which a particular act of resistance by Hanny Schaft is part of the Second World War is the same as the sense in which Hanny's hand at a certain interval is part of Hanny at that (or a larger) interval.

Similarly, the stage of Hanny in 1940 is part of the stage of Hanny in 1940—1941. But the latter two stages have a more intimate relation: they are both stages of Hanny, and the second stage is a more developed version of the first; the first has grown into the second, so to speak.

Though they are different entities, we can say of both these stages, "That's Hanny, in different stages of development." There is a clear sense in which we cannot point at a stage of Hanny's hand and say, "That's Hanny in yet another stage of development." It's this more intimate relation between stages of individuals in Carlson's ontology that corresponds to the relation 'stage-of' between events in the present theory.

An event is a stage of another event if the second can be regarded as a more developed version of the first, that is, if we can point at it and say, "It's the same event in a further stage of development." Thus, not every part of e at an interval is a stage of e; to be a stage, a part has to be big enough and share enough with e so that we can call it a less developed version of e.

Obviously, there are many constraints that we would want to impose on the relations of 'part-of' and 'stage-of'. Unfortunately, I do not have the space to go into such constraints here. I will assume the following: an event e can be a stage of two events f and g even where f and g are not stages of a common event. That is, an event can *possibly* develop into different events (my walking now can possibly develop into a walking to Rome and into a walking to Tietjerksteradeel). But *within* a given world this is not possible: if e is a stage of f and of g and all of e, f, and g are located (by t) in w, then f and g are stages of a common event h located in w (if my walking actually develops into both a walking to Rome and to Tietjerksteradeel, then those are part of the same walking event, which by the nature of walking means that I pass through one on the way to the other). (In general, I assume that the set of events in w that e is a stage of has a maximum.)

The most important reason why I think we need stages of events, rather than just parts, is the following. In the subjunctive proposal for the progressive we look at a certain event in a world and at its continuation until it stops in that world. What does it mean that the continuation of event e stops at a certain interval i in our world? Our first inclination might be to say that this means that at i there is an event of which e is part, but that there is no event of which e is part that is realized in w at an interval extending beyond i. But this can't be correct: Hanny Schaft's acts of resistance stopped when she was murdered before the end of the Second World War; they are part of the Second World War but it extends beyond them. The above suggestion would entail that her resistence acts did not stop. This is where stages come in: we cannot say that when an event stops in a world, there is no bigger event of which it is part in that world, but we can say that when it stops, there is no bigger event in the world of which it is a *stage*:

> Let e be an event that goes on at i in w. Let f be an event that goes on at j in w, where i is a subinterval of j.
> f is a *continuation* of e iff e is a stage of f.
> Let j be a non-final interval.
> f *stops* at j in w iff no event of which f is a stage goes on beyond i in w (i.e., at a later ending interval).

A second use I will make of stages is in giving a version of Dowty's activity postulate. As I indicated above, the stages of e are in an important sense more like e than any arbitrary parts are. I will assume that very often, stages will share certain characteristics with the event that they are a stage of. Some terminology:

> Let f be an activity or accomplishment and e a stage of f.
> e is a *process stage* of f iff e has the same process characteristics as f.

This means that if f is a process of Mary running, e is also a process of Mary running, and that if f is an event of Mary running to the store, e is a process of Mary running.

I will not assume that every stage of an accomplishment e is a process stage. For futurate progressives I will allow the possibility that they start with what could be called a planning stage, where the process hasn't properly started yet. Furthermore, I will allow for the existence of pause stages (like the stage in the middle of a performance of the St. Matthew Passion) where the process is temporarily halted. I will assume the following:

Activity Postulate

> The stages of accomplishment or activity e are either process, planning, or pause stages. Planning stages precede all process stages. Pause stages are flanked left and right by process stages.

As we will see, with this postulate we will be able to deal with the activity part of the imperfective paradox.

2.3. *Normality*

We now return to examples (11) and (20).

(11)   Mary was crossing the street.

(20)   Mary was wiping out the Roman army.

Let us assume that a stage c of (11) and a stage r of (20) is going on in our world w. We assume that the continuation of c and the continuation of r in our world get interrupted as before (let's throw in reincarnation).

We said earlier that (20) is not true, intuitively, because Mary doesn't have a reasonable chance of wiping out the Roman army. The problem was that Mary doesn't have a reasonable chance of crossing either, because of the truck; it's not clear how (20) can be false but (11) true.

This problem is, I think, the same as the one we raised earlier for Dowty's proposal, the one that led to the normality proposal. In determining what chance a stage has of continuing, we abstract away from facts about the world that are external to that stage. Thus we are not interested in the absolute chance that the stage has of continuing, given all the facts about the world, but in its chance of continuing *solely on the basis of what is internal*, inherent to that stage. Thus, in the case of (11), the truck is irrelevant. What is relevant is whether c is the kind of process of which it is normally reasonably within Mary's capacity that she will complete it. Similarly, the actual Roman soldier interrupting (20) is not relevant. What is relevant is, e.g., Mary's inherent capacity to wipe out the Romans and the balance of strength between her and them.

Now let us look at a world v where c does continue and Mary manages to cross and a world z where r does continue and Mary manages to wipe out the Roman army. Intuitively, what is the difference between v and z? I think it is the following:

> There is no reasonable chance, on the basis of what is internal to r in w, that r will continue in w as far as it does in z, while there is a reasonable chance, on the basis of what is internal to c in w, that c will continue in w as far as it does in v.

I think that this is the reason why (20) is false. I will say that z is not a reasonable option for r in w, while v is a reasonable option for c in w. I will assume that the model assigns to event e in w a set of worlds, $R(e, w)$, the set of *reasonable options* for e in w, where we understand $R(e, w)$ as follows:

> $v \; \varepsilon \; R(e, w)$ iff there is a reasonable chance on the basis of what is internal to e in w that e continues in w as far as it does in v.

Let's now go back to (17) on the second scenario, where Mary manages to cross.

(17)   Mary was crossing the Atlantic.

Let c be the stage after half an hour of swimming. In this case, the real world w is not a reasonable option for c in w: on the basis of what was internal to c, Mary had no chance of crossing. Yet we can assent to (17). The fact that the real world is not a reasonable option is irrelevant here. Hence, *within* a given world we just look at how an event actually continues, without objecting, "But that's not reasonable." What is relevant is what happens in a world, not whether it is reasonable.

This means that if reasonable chance plays a role in the semantics of the progressive — and we have good reason to believe that it does — the only place where it can play such a role is as part of the subjunctive.

I think this is very natural. On the subjunctive proposal, we follow the actual continuation of our event e in our world until it stops. Then we perform a thought experiment: How would e have continued if it hadn't stopped? But we only do so if the thought experiment is reasonable on the basis of what is internal to e; if the thought experiment brings us to a world where e continues further than is reasonable on the basis of e itself, we don't perform it. I will incorporate this idea into:

2.4. *The Continuation Branch*

I will assume (for ease) a Stalnaker-style theory of subjunctives, that is, I will assume that if event e stops in w, there is a closest world where e doesn't stop. I take the latter in the strict way: this is the closest world where whatever it is that stops e in w doesn't stop e now. This means that in the case of multiple trucks discussed earlier, the closest world where Mary's crossing doesn't stop is the closest world where the first truck doesn't interrupt her crossing (and not the world where there is no danger of interruption).

Let e be an event that goes on in w. I will define $C(e, w)$, the continuation branch of e in w.

The *continuation branch* for e in w is the smallest set of pairs of events and worlds such that

1. for every event f in w such that e is a stage of f, $\langle f, w \rangle \varepsilon C(e, w)$; the continuation stretch of e in w;

2. if the continuation stretch of e in w stops in w, it has a maximal element f and f stops in w. Consider the closest world v where f does not stop:
   — if v is not in $R(e, w)$, the continuation branch stops.
   — if v is in $R(e, w)$, then $\langle f, v \rangle \varepsilon C(e, w)$. In this case, we repeat the construction:

3. for every g in v such that f is a stage of g, $\langle g, v \rangle$ ε $C(e, w)$, the continuation stretch of e in v;

4. if the continuation stretch of e in v stops, we look at the closest world z where its maximal element g does not stop:

— if z is not in $R(e, w)$, the continuation branch stops.

— if z is in $R(e, w)$, then $\langle g, z \rangle$ ε $C(e, w)$ and we continue as above, etc.

In a picture:
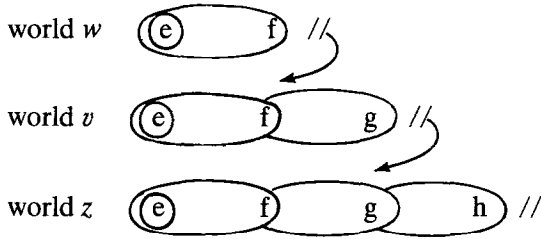
So the idea is that you follow e in our world: if its continuation stops, you follow it in the closest world where it doesn't stop, if that world is a reasonable option for e in w; if the continuation stops in that world, you go to the closest world again, if it's reasonable, and you continue until either in some world it doesn't stop (and then you stay in that world) or, the more normal case, your reach a point where going to the closest world is no longer reasonable and you stop there.

Now we can provide the semantics for the progressive. The progressive is a relation between an event e and an event type P:

$$[\mathrm{PROG}(e, P)]_{w,g} = 1 \text{ iff } \exists f \exists v : \langle f, v \rangle \text{ ε } \mathrm{CON}(g(e), w) \text{ and}$$
$$[P]_{v,g}(f) = 1$$

where $\mathrm{CON}(g(e), w)$ is the continuation branch of $g(e)$ in w.

Thus, $\mathrm{PROG}(e, P)$ is true in w relative to g if in some world on the continuation branch of $g(e)$ in w, some event realizes the event type P. Note that by the definition of continuation branch, this means that $g(e)$ is a stage of that event.

We translated *Mary was building a house* as:

$$\exists e'.t(e') < now \wedge \mathrm{PROG}(e', \lambda e.\exists y[\mathrm{House}(y) \wedge \mathrm{Build}(e) \wedge$$
$$A(e) = m \wedge T(e) = y])$$

This is true in w iff there is an e such that $t(e, w) < now$ and for some f, v such that $\langle f, v \rangle$ is on the continuation branch of e in w the following holds: there is a d ε $V(\text{house}, v)$ such that f is a building at $t(f, v)$ in v and

m is the agent of f and d is the theme of f. In other words, in some world, an event of building a house by Mary goes on, a stage of which goes on in our world at some past interval, a stage, which develops into that event on its continuous branch.

2.5. *The Problems Revisited*

Let us see what this analysis has to say about the problems we have discussed.

We start with the imperfective paradox. The accomplishment (3), *Mary was drawing a circle*, is true in w if some stage of an event e realizing the event type *Mary draw a circle* went on in w at some past interval and this stage grows into e somewhere on the continuation branch. This requires e to go on in some world on the continuation branch. Since that world need not be w, (3) does not entail (4): *Mary drew a circle.*

The activity (1), *Mary was pushing a cart*, is true in w under similar circumstances. But we know that what goes on in w is a stage of the event realized on the continuation branch. If this stage is a process stage, it shares the process characteristics with the event, which means that it itself is an event that realizes the event type *Mary push a cart*. This means that it makes (2), *Mary pushed a cart*, true. If the stage is a pause stage (Mary is spitting in her hands for a second), it is preceded by a process stage and that stage makes (2) true. It is not clear whether the progressive can be a futurate progressive in this example, i.e., whether the stage can be a planning stage. If it can, (1) does not entail (2) on that interpretation which is as it should be; the activity entailments that the imperfective paradox is concerned with do not hold for the futurate progressive.

Concerning the problems of modality, it should be clear that the present analysis correctly predicts that the object position (but not the subject position) of transitive verbs in the progressive is an intensional context. (9), *God was creating a unicorn, when He changed his mind*, is true if some creation stage is going on in the real world and if we follow that stage through the real world up to the moment where God changes His mind, then go to the closest world where He doesn't and follow Him there; then ultimately, a unicorn gets created in that world, or some later world. This, of course, does not entail that in the real world there is a unicorn that God was creating.

Let's look at interruptions now.

(13)   Mary was crossing the street, when the truck hit her.

We follow Mary's crossing in w until it stops because the truck hits her.

We go to the closest world where her crossing continues. There the truck doesn't hit her. On the basis of her crossing and her usual skill of road-crossing she had a very reasonable chance of getting in the real world as far as she gets in this world. In this world she manages to cross. Under these circumstances (13) is true.

(17)   Mary was crossing the Atlantic.

On the first scenario we follow Mary's crossing until she sinks. Now we look at the closest world where she continues. Maybe it is reasonable to think, on the basis of her capacities, that she gets a bit further, so we follow her there. She does a few more laps, maybe she even swims for ten more minutes, and then she sinks. We look at the closest world where she continues. Maybe we can still argue that she should get a few more laps done. But it's quite clear that after a few of these thought experiments, it is no longer reasonable to think that she would have had a chance in the real world to get that far. The continuation branch stops long before she gets to the other side. The full crossing does not get realized on the continuation branch. (17) is false.

On the second scenario, divine intervention carries her across. We follow her in the real world until the event stops. It stops on the other side of the Atlantic, so a complete crossing of the Atlantic is realized on the continuation branch. (17) is true.

(20)   Mary was wiping out the Roman army.

This case is essentially the same as (17) on the first scenario. We follow Mary till she gets killed. We remove the soldier that kills her and follow her till the next soldier kills her. We can do this for a couple of steps, but at some point, long before she has wiped out the Roman army, it's just not plausible any more that in the real world she would have a chance of killing that many soldiers. The continuation branch stops and (20) is false.

(18)   Mary was crossing the street, when the first truck hit her.

(19)   If the first truck hadn't hit her, the second truck would have.

We follow Mary in the real world until the first truck hits her. As in the case of (13), we zap away the first truck and follow her in the closest world. (19) tells us that there Mary's crossing stops when the second truck hits her. When we zap away the second truck and continue, it is still quite plausible that, on the basis of what is internal to the crossing, Mary had a good chance of getting in the real world as far as she gets after zapping

away two trucks. So we continue her crossing, and she gets to the other side. (18) is true.

Thus, the continuation branch seeks the middle ground between removing only the actual interruptor and removing all danger of interruption: we remove the potential interruptors one at a time. If we can do that and still end up in a world which is a reasonable option and where the relevant event gets realized, the progressive is true.

I think that the present analysis of the progressive combines the insights of the different previous analyses. This theory is like the part-of proposal in that it takes the progressive to be a relation between an event and an event type; it is like the normality proposal in that the modal part of it makes use of a normality notion, in this case, reasonable chance; and it is like the subjunctive proposal in that it builds the semantics from two distinct types of operations: continuation in a world and counterfactual reasoning. It differs from the previous theories in what exactly the ingredients are — stages — and in how they are put together — the continuation branch.

Although the problems discussed seemed to pull in different directions, the present theory shows, I think, that it is nevertheless possible to give them a unified account.

APPENDIX: PERSPECTIVES

Let's go back once more to (17), *Mary was crossing the Atlantic*, on the second scenario, with divine intervention. What I claimed was that I could easily say, in hindsight, "I would never have believed it at the time, but she was actually crossing the Atlantic." I indicated that for the argument that I was making, the only thing important is that this reaction is *possible*. The analysis of the progressive has to explain its possibility. I also indicated that I do not want to claim that it is the only possible reaction.

Suppose you give the following account: "Before the miracle she wasn't crossing the Atlantic, she was only trying to cross, but the miracle changed everything: after the miracle she was crossing the Atlantic." I think this reaction is also possible, and even though the two reactions are incompatible, I do not think that we can argue that only one of them is correct.

A more natural case of the same phenomenon is found in the following situation (brought up by Roger Schwarzschild). Suppose I was on a plane to Boston which got hijacked and landed in Bismarck, North Dakota. What was going on before the plane was hijacked? One thing I can say is: "I was flying to Boston when the plane was hijacked." This is reasonable. But another thing I could say is: "I was flying to Boston. Well, in fact, I

wasn't, I was flying to Bismarck, North Dakota, but I didn't know that at the time." And this is also reasonable.

These cases show something that has long been recognized, namely, that the notion of event as it plays a role in semantics is not an absolute notion (see especially Kamp 1979). What events there are, where they begin and where they end, which events are stages of which other events — all that depends on what we single out as events in a certain context and how we do so. Borrowing a term from ter Meulen (1987), what we carve out as an event and what we decide to regard as stages of that event depends on our *perspective* in a certain context.

Perspectives are determined by the context and manipulated in context like other contextual factors. We may entertain more than one perspective at a time, and in the course of a conversation, we can easily change from one perspective to another.

I think that the above cases are ones of perspectual difference, and for that reason we do not have to decide which one is right; that depends on which perspective you adopt.

When I say, "I was flying to Boston," I assume a perspective where there are two relevant continuations: First we have a flying stage, which is a stage of a flight to Boston and which continues until it is stopped by the hijacking. With the hijacking a new, second flying stage starts, this time a stage of a flight to Bismarck. On this perspective, before the hijacking I was flying to Boston and not to Bismarck. The other perspective focusses on the actual flight. It starts when we take off and stops when we land in Bismarck. The hijacking doesn't stop this process; it just changes its direction. On this perspective, we have one relevant continuation which only stops when the plane lands. Before and after the hijacking I was flying to Bismarck.

Since I think that both perspectives are reasonable, we need a theory that can account for both reactions. If we add perspectives to the theory and assume that our event domains and their structure are perspective dependent, the present theory can account for both.

hibernation for a rather long time. It was woken from this by the stimulating comments of Renate Bartsch, Ginny Brennan, Nirit Kadmon, and Alice ter Meulen. Since then, I have presented versions of this paper in colloquia at Cornell University, the University of Pennsylvania, Ben Gurion University of the Negev, the Hebrew University of Jerusalem, Tel Aviv University, Ohio State University, and the University of Massachusetts. I thank the audiences of these presentations, with special thanks to Edit Doron, David Dowty, Nirit Kadmon, Igal Kvart, Anita Mittwoch, Craige Roberts, and Roger Schwartzschild.

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