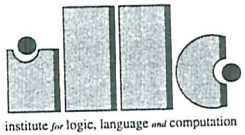

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vertex graph is $0-0, j-3, j-l, 1-1, k-m, k-2, l-3, 2-m$, and satisfies the connectedness constraints.[2]

Bibliography

Calcagno, M.: 1995, 'A Sign-Based Extension to the Lambek Calculus for Discontinuous Constituency', *Bulletin of the Interest Group in Pure and Applied Logics* **3**, 555–578.

Girard, J-Y.: 1987, 'Linear Logic', *Theoretical Computer Science* **50**, 1–102.

Hendriks, P.: 1995, *Comparatives and Categorial Grammar*, Ph.D. dissertation, Rijsuniversiteit Groningen.

Lambek, J.: 1958, 'The mathematics of sentence structure', *American Mathematical Monthly* **65**, 154–170, also in Buszkowski, W., W. Marciszewski, and J. van Benthem (eds.): 1988, *Categorial Grammar*, Linguistic & Literary Studies in Eastern Europe Volume 25, John Benjamins, Amsterdam, 153–172.

Moortgat, M.: 1988, *Categorial Investigations: Logical and Linguistic Aspects of the Lambek Calculus*, Foris, Dordrecht.

Moortgat, M.: 1990, 'The Quantification Calculus: Questions of Axiomatisation', in Deliverable R1.2.A of DYANA Dynamic Interpretation of Natural Language, ESPRIT Basic Research Action BR3175.

Moortgat, M.: 1991/96, 'Generalised Quantification and Discontinuous type constructors', in Bunt and van Horck (eds.) *Discontinuous Constituency*, Mouton de Gruyter, Berlin, 181–208.

Moortgat, M.: 1996, 'In situ binding; a modal analysis', *Proceedings Tenth Amsterdam Colloquium*, Institute for Logic, Language and Computation, Amsterdam.

Moortgat, M. and R.T Oehrle: 1994, 'Adjacency, dependency and order', *Proceedings Ninth Amsterdam Colloquium*, Institute for Logic, Language and Computation, Amsterdam, 447–466.

Morrill, G.: 1992, 'Categorial formalisation of relativisation: pied piping, islands, and extraction sites', Report de Recerca LSI–92–23–R, Departament de Llenguatges i Sistemes Informàtics, Universitat Politècnica de Catalunya.

Morrill, G.: 1994, *Type Logical Grammar: Categorial Logic of Signs*, Kluwer Academic Publishers, Dordrecht.

Morrill, G.: 1995, 'Discontinuity in Categorial Grammar', *Linguistics and Philosophy* **18**, 175–219.

Morrill, G.: 1996, 'Memoisation of Categorial Proof Nets: Parallelism in Categorial Processing', Report de Recerca LSI–96–24–R, Departament de Llenguatges i Sistemes Informàtics, Universitat Politècnica de Catalunya. Also in M. Abrusci and C. Cadasio (eds.) *Proofs and Linguistic Categories*, CLUEB, Bologna, 157–169.

Morrill, G.: 1997, 'Geometry of Language', Report de Recerca LSI–97–45–R, Departament de Llenguatges i Sistemes Informàtics, Universitat Politècnica de Catalunya.

Morrill, G. and Merenciano, J.M.: 1996, 'Generalising Discontinuity', *Traitement Automatique des Langues* **37**, *2*, 119–143.

Morrill, G. and T. Solias: 1993, 'Tuples, Discontinuity and Gapping', Proceedings *Meeting of the European Chapter of the Association for Computational Linguistics*, Utrecht, 287–297.

Roorda, Dirk: 1991, *Resource Logics: proof-theoretical investigations*, Ph.D. dissertation, Universiteit van Amsterdam.

Solias, T.: 1992, *Gramáticas Categoriales, Coordinación Generalizada y Elisión*, Ph.D. dissertation, Universidad Autónoma de Madrid.

[2]In view of space limitations the reader is invited to check the sequent calculus and proof net derivability of $R/((S\uparrow N)\odot I)$, N, $((((N\backslash S)/VP)\uparrow N)\odot I)/N$, N, VP $\Rightarrow$ R (and underivability of N, $((((N\backslash S)/VP)\uparrow N)\odot I)/N$, N, N, VP $\Rightarrow$ S) corresponding to the obligatory extraction (10), of N, $((N\backslash S)/N)/N$, $\{Q(S, N, S)|Q(N\backslash S, N, N\backslash S)\}$, N $\Rightarrow$ S corresponding to the quantification and reflexivisation (11), and of $Q(S, N, S) \Rightarrow Q(N\backslash S, N, N\backslash S)$.

Decomposing the progressive

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1. Introduction

The formal semantics of the *progressive aspect* is notoriously difficult to pin down, as a number of analyses in recent years attest (Dowty 1979:§3, Vlach 1981, Parsons 1990:§9, Bach 1986, Kearns 1991, Asher 1992, Landman 1992, Glasbey 1996, among others).[1] Broadly speaking, the progressive presents two sorts of problems: (*i*) (what we might call) the 'state-related problem' and (*ii*) (what Dowty calls) the 'imperfective paradox'. The state-related problem concerns the aspectually *stative* character of the progressive, the difference between 'progressive states' and 'ordinary states', the 'backgrounding' function of the progressive at the discourse level, etc. In contrast, the imperfective paradox is the problem that has attracted the most attention in the formal semantics literature: it consists in the observation that whereas the progressive of an activity expression entails the realization of the activity, the progressive of an accomplishment expression does not entail the realization of the accomplishment, as seen in (1a) and (1b), respectively.

(1) a. Rebecca was writing (when the computer crashed).
$\models$ Rebecca wrote. (activity)

b. Rebecca was writing the review (when the computer crashed).
$\not\models$ Rebecca wrote the review. (accomplishment)

For progressives of accomplishments such as that in (1b), the task is to say what it means for Rebecca's writing of the review to be 'in progress' when she has not yet written the review.

In this paper we propose a new analysis of the imperfective paradox. In doing so, we ignore the state-related problem of the progressive. The limitation is practical: we cannot cover the whole ground in a short paper, and the issues relating to the imperfective paradox seem to be clearer than those associated with the state-related problem. In any case, the limitation should not be taken to mean either that the state-related problem has a generally accepted solution (it does not) or that it is desirable to study the imperfective paradox in isolation from the state-related problem (arguably, it is not).

2. Issues

An inescapable fact about the progressive is that the events entailed are related in a direct way to the events denoted by the corresponding nonprogressive clause.[2] In (1a), this is obvious: we infer that Rebecca wrote and did not (say) eat or drink. Yet even in (1b), where the corresponding accomplishment is not entailed, it is at least true that Rebecca wrote part of the review. This observation might suggest that we can always use the verb of the corresponding nonprogressive clause to describe the events entailed by the progressive.[3] However, that we cannot always do so is shown by the examples in (2).

(2) a. Mary was making John a millionaire.
b. Rebecca was rescuing Peter.

[1]This work was supported by the *Deutsche Forschungsgemeinschaft* (*SFB* 282, *Teilprojekt* D3) (Naumann, Piñón) and by a fellowship from Collegium Budapest / Institute for Advanced Study (Piñón). I (Piñón) am grateful to Willi Geuder and the *Graduiertenkolleg* at *Universität Tübingen* for an invitation to lead an informal discussion on the progressive on 10 July 1997, an occasion which inspired me to begin thinking more earnestly about the topic. Comments welcome at: {*naumann, pinon*}*@phil-fak.uni-duesseldorf.de*

[2]Anticipating the analysis in section 3, we speak freely of events in describing the data.

[3]This observation is the springboard for *extensional* analyses of the progressive (Parsons 1990:§9, Kearns 1991:§5). Applied to the sentence in (1b), the strategy is to say that even unfinished reviews are reviews and therefore that the entailment in (1b) (despite initial appearances) is valid. However, since this strategy does not work for the examples in (2), an extensional analysis of the progressive is not tenable more generally.

In (2a), it is clear that Mary did something that could directly result in John's being a millionaire, but at the time that the progressive is uttered she need not have made him any money yet. Similarly, in (2b), although what Rebecca did could directly result in Peter's being rescued, she need not have accomplished any rescuing yet when the progressive is uttered. Examples of this kind provide evidence in favor of a *modal* analysis of the progressive: we can describe the events entailed by the progressive only by reference to their possible (but not necessarily actual) outcomes.

What unites the examples in (1) and (2) is that the events entailed by the progressive are possibly *parts* of events denoted by the corresponding nonprogressive clauses. In (1), since it is reasonable to suppose that any writing event has writing events as parts, we can infer from the use of the progressive that there is a writing event with Rebecca as its agent. In (2), although the events entailed are not semantically determined in this way, it is still reasonable to think that they could be parts of those denoted by the corresponding nonprogressive clauses. After all, not anything goes: an event in which Mary swims in the local pool would not normally verify the truth of (2a), precisely because it is difficult to see how her swimming could be part of an event in which she makes John a millionaire. However, if her swimming in the local pool somehow induced wealthy investors to invest in John's company, such an event could support the truth of (2a). A similar semantic indeterminacy arises in (2b): the events entailed are possibly parts of rescuing events, but the range of events that count as parts of rescuing events is not semantically fixed.

In any case, an analysis of the progressive requires more than a little modality and an appeal to parts: this is evident when the progressive is used in assertions that are difficult to evaluate as true or false. Imagine a situation in which a coin is flipped up into the air: if the odds are even, it would be infelicitous to utter one of the sentences in (3) (or its negation, for that matter). Intuitively, it is difficult to see why the coin is or is not coming up heads (tails)—since we do not have any reason for favoring the one outcome over the other, use of the progressive is odd.[4]

(3) a. The coin is (isn't) coming up heads.
b. The coin is (isn't) coming up tails.

Notice that the issue here is not what counts as part of an event in which the coin comes up heads (tails), for *that* is fairly clear: the coin follows a trajectory through space, it is on its descent, it has already fallen part of the way down. The problem, rather, is that use of the progressive appears to force us into accepting a kind of weak determinism with respect to the possible outcome which we are not inclined to accept in this situation, precisely because—as far as we can tell—the odds are even.

This phenomenon arises in other examples as well. Suppose that Rebecca draws a straight line on a piece of paper and at that point we utter one of the sentences in (4) (or its negation). Intuitively, unless we assume something about Rebecca's intentions, these assertions are difficult to evaluate as true or false: since a straight line could be part of either a square or triangle, how do we decide which of the two she is drawing? Again, we simply do not have any reason, given what we see, for favoring the one outcome over the other.

(4) a. Rebecca is (isn't) drawing a square.
b. Rebecca is (isn't) drawing a triangle.

Suppose, however, that we believe that Rebecca intends to draw a square: then it is much easier to evaluate the (positive) sentence in (4a) as true and the (positive) one in (4b) as false. Intuitively, this is because our believing that Rebecca intends to draw a square is enough to satisfy the kind of weak determinism that use of the progressive appears to demand: we should have grounds for favoring the possible outcome described over other possible outcomes. Similarly, if we believe that Rebecca intends *not* to draw a square, then the negative sentence in (4a) appears to be true. In this case, though, it is still difficult to evaluate the assertions in (4b) as true or false, because our belief of Rebecca's intending not to draw a square leaves it of course open whether she is drawing a triangle.

While intention plays an important role in the semantics of the progressive, there is more to the story. The assertions in (5) seem to be false, even if we are willing to believe that Rebecca intended to swim across the Atlantic and that Peter intended to wipe out the Russian army. Intuitively, the problem is that we also believe that Rebecca and Peter, as ordinary human beings, were not able to accomplish such feats, no matter what their intentions may have been.

(5) a. Rebecca was swimming across the Atlantic.
b. Peter was wiping out the Russian army.

The interesting twist about such examples is that their truth value depends in part on the utterance time. In (5a), suppose that Rebecca's swim was videotaped. If we were on location at the time when she had swum the first kilometer, we would most likely have denied the assertion in (5a) then. If, however, it later turns out that Rebecca managed to accomplish what we took to be humanly impossible and we are watching the first kilometer of her swim on video, we would most likely evaluate the assertion in (5a) as true now. Observe, crucially, that we need not assume that Rebecca's abilities actually changed during the swim: Rebecca may have had superhuman swimming abilities all along, but we believed (mistakenly, it turned out) that she did not have such abilities. A similar scenario could be constructed for the example in (5b) to make the same point.

Having the ability to do something should be kept distinct from the possibility (under the circumstances) of exercising that ability. In (5), we judge the assertions as false because we believe that the respective agents did not have the described abilities. Clearly, if one does not have a particular ability, then there is no possibility of exercising that (nonexistent) ability. But having a particular ability does not mean that it is always possible to exercise it, because incidental factors may prevent one from doing so.

With this in mind, consider the sentences in (6), which we are inclined to accept as true, assuming the described situations. In (6a), if the minefield had a fair number of mines and Mary did not know their exact whereabouts, the chances were slim that she would manage to run across. Likewise, in (6b), if there were many speeding trucks on the road, then the chances were not good that Peter would succeed in walking across, especially if he were not careful. However, despite the pessimistic outlooks involved, we are more inclined to evaluate the assertions in (6) as true than those in (5).

(6) a. Rebecca was running across the minefield.
b. Peter was walking across the road with speeding trucks.

The difference between the situations described in (5) and (6) turns on ability. If Rebecca wants to run across the minefield successfully, then she should know where the mines are so that she can avoid them. But beyond this, the ability to run across a minefield is no different than the ability to run across a field, and we believe that Rebecca is able to run across a field. Similarly, if Peter wants to walk across the road with speeding trucks successfully, he should take utmost care and wait for a maximally large break in the traffic, but other than this, we do not doubt that he is able to walk across the road. In neither case does Rebecca or Peter have to acquire an ability that they do not already have. This conclusion is consistent with the possibility that Rebecca or Peter will not be able to exercise their respective abilities under the circumstances.

In (5), the matter is different: here we believe that Rebecca is not able to swim across the Atlantic and that Peter is not able to wipe out the Russian army. Swimming across the Atlantic is not like swimming across a lake: a new ability is required to accomplish the former. Similarly, wiping out the Russian army is not like wiping out a few gangsters: two different abilities are at issue. Even if the circumstances are extremely favorable, humans are not able to do such things single-handedly.

The issues touched upon in this section concerned modality, parts of events, belief, intention, and ability. In the next section, we show how these notions figure in a semantics for the progressive.

[4] Examples like those in (3) originally motivated Dowty's (1979:147–148) appeal to *inertia worlds*. Dowty points out that such sentences turn out to be true in his earlier analysis (without inertia worlds), which is a counterintuitive result, and that the introduction of inertia worlds makes them come out as false, which is a step better. Our view is that such sentences tend to lack a true value in most circumstances and in section 3 we analyze them as involving a presupposition failure.

3. Analysis

The hallmark of the analysis to follow is that the meaning of the progressive is *decomposed* into four independently needed notions: *realization*, *belief*, *ability*, and *intention*. Ability and intention, in contrast to realization, are *relativized* to the belief of the speaker at the utterance time. Working in tandem, these four notions yield a characterization of what it means for an event of a particular type to be 'in progress'.

For reasons of convenience and perspicuity, we present the analysis in (what we take to be) a familiar and transparent logic, essentially that of a *many-sorted type theory* (cf. Gallin 1975:§8, Gamut 1991:§5.8). In particular, we postulate four sorted domains: worlds, ordinary individuals, events, and times. Accordingly, the logic has inventories of variables and constants of different logical types that have these sorts of objects in their extensions. Characteristic of many-sorted type theory is that s, like e and t, is a type: consequently, variables for worlds (w, w', ...) appear in the object language and may be quantified and abstracted over. Note that constants whose extension varies from world to world are equipped with a (free) variable of type s. We assume that the progressive is represented by an operator whose logical type is that of a modifier of event predicates (i.e., $\langle\langle e, t\rangle, \langle e, t\rangle\rangle$), which presupposes that verbs are analyzed as predicates with an event argument, as is usual in event semantics.

We begin with the role of *realization*: if an event e of type P is in progress, then e is a partial realization of an event e' of type P. Invoking existential quantification over worlds and a *part relation* on events, the latter clause may be reformulated as 'then there is a world w in which e is part of an event e' such that e' is an event of type P', as formalized in (7), where '$\sqsubseteq_w$' denotes the (improper) part relation at world w.

(7) $\mathsf{Real(e, P)} \triangleq \exists w \exists e'[e \sqsubseteq_w e' \wedge P(w)(e')]]$ (e is a partial realization of P)

Observe that, due to the existential quantification over worlds, it is left open whether there is such an event e' in the actual world.

Applied to the sentence in (1b), realization requires that the event in progress be possibly part of one in which Rebecca writes the review. Coupled with a constraint stating that parts of an event in which Rebecca writes the review are events in which she writes part of the review, we rule out the possibility that the event in progress in (1b) is one in which Rebecca (say) eats part of an apple, for no event in which she eats part of an apple is possibly part of one in which she writes the review. Realization applies to the examples in (2) with equal force, though here we have the additional problem of having to decide what counts as parts of an event in which Mary makes John a millionaire, etc., which depends on considerable extralinguistic knowledge, as claimed in the previous section.

Realization is subject to a *presupposition* requiring that the speaker believe at the utterance time that the event in progress is *not* the partial realization of two *incompatible* event types, i.e., the presupposition demands that the speaker believe that the event in progress is *not* wildly *indeterministic* with respect to its event type. The *compatibility relation* between event types is defined in (8a): types P and P' are compatible just in case there is a world w in which an event e is of both types. The presupposition is then formulated in (8b): if event e is a partial realization of type P in the actual world, then the speaker x_{Spr} believes at the utterance time t_{Utt} in world w that any type P' that e is a partial realization of is compatible with P.

(8) a. $\mathsf{Comp(P, P')} \triangleq \exists w \exists e[P(w, e) \wedge P'(w, e)]$ (P and P' are compatible)

b. $\mathsf{Real(e, P)} \rightarrow \mathsf{Bel(w, t_{Utt}, x_{Spr}, \lambda w'[\forall P'[Real(e, P') \rightarrow Comp(P, P')]]})$
(presupposition: speaker's belief in compatibility of partially realized event types)

Observe that the propositional argument of Bel is represented by abstraction over possible worlds (extensionally, the set of worlds w' in which it is true that if e is the partial realization of a type P', then the types P and P' are compatible).

The presupposition in (8b) is motivated by examples like those in (3) and (4). In (3), since the speaker does not believe that the event type in which a coin comes up heads is compatible with the event type in which the same coin comes up tails, the presupposition in (8b) fails to be satisfied. Before the coin has landed, the speaker believes that the event in progress may be a partial realization of either event type and has no grounds for favoring the one over the other. Similarly, in (4), if that the speaker does not assume anything about Rebecca's intentions, then there are no grounds for deciding between the possible realizations (a drawing of a square vs. a drawing of a triangle) of the event in progress, and so the presupposition in (8b) is once again not satisfied. Thus we claim that the difficulty of assigning a truth value to the sentences in (3) and (4) is due to a presupposition failure.

The role of *ability* is as follows: if the event in progress has an agent, then the speaker believes at the utterance time that the agent is *able* at the time of the event in progress to carry out an event of the type in question. In (9a), the predicate Able is defined as a four-place relation between a world w, a time t, an individual x, and an event type P (intuitively, x is able at t in world w to carry out P). According to the definition, x is able at t in world w to carry out P just in case there is a world w' in which x is the agent of an event e of type P and the time of e temporally overlaps with t and w' is compatible with the abilities of x at t in w (where '$\circ_w$' denotes *temporal overlap* at world w and 'τ' denotes the *temporal trace function* for events, the value of which when applied to a particular event is assumed to be rigid). Note that $R_{Ability}$, which we take as primitive, is a kind of *accessibility relation* among worlds: for a world w, a time t, and an individual x, $R_{Ability}$ relates those worlds w' that are compatible with the abilities of x at t in w. The embedding of Able under Bel is given in (9b).

(9) a. $\mathsf{Able(w, t, x, P(w))} \triangleq$
$\exists w' \exists e[P(w', e) \wedge Agent(w', e, x) \wedge t \circ_{w'} \tau(e) \wedge R_{Ability}(w, t, x, w')]$
(x is able at time t in world w to carry out an event of type P)

b. $\mathsf{Bel(w, t_{Utt}, x_{Spr}, \lambda w'[Able(w', t', y, P(w'))])}$
(speaker's belief that agent is able to carry out P)

Examples like those in (5) motivate the inclusion of the speaker's belief of the agent's ability in the meaning of the progressive. Since we generally do not believe that human beings are single-handedly able to swim across the Atlantic or to wipe out the Russian army, we tend to judge the assertions in (5) as false. And this is so even if the events in progress satisfy Real in (7), for it is logically possible that Rebecca or Peter will succeed, but we clearly do not believe that such worlds are compatible with the abilities of Rebecca or Peter at the time of the event in progress in the actual world. Note, crucially, that since the speaker's belief of the agent's ability in (9b) is dependent on the utterance time, if it turns out that Rebecca does in fact succeed in swimming across the Atlantic, we might revise our beliefs about her abilities and later evaluate the assertion in (5a) as true.

Finally, we address the role of *intention*: if the event in progress has an agent, then the speaker does *not* believe at the utterance time that the agent intends at the time of the event in progress *not* to carry out an event of the type in question. In (10a), the predicate Intend is defined as a four-place relation between between a world w, a time t, an individual x, and the set of worlds w' in which x is the agent of an event e of type P and the time of e temporally follows t (intuitively, x intends at t in world w to carry out an event e of type P). According to the definition, Intend applies just in case in all worlds w' that are compatible with the intentions of x at t in w, x is the agent of an event e of type P and the time of e temporally follows t (where '$<_w$' denotes *temporal precedence* at world w). Again, the relation $R_{Intention}$ is a kind of accessibility relation among worlds: for a world w, a time t, and an individual x, $R_{Intention}$ relates those worlds w' that are compatible with the intentions of x at t in w. The speaker's *not* believing that the agent intends *not* to carry out an event e of type P is represented in (10b).

(10) a. $\mathsf{Intend(w, t, x, \lambda w'[\exists e[P(w', e) \wedge Agent(w', e, x) \wedge t <_{w'} \tau(e)]]) \triangleq}$
$\forall w''[R_{Intention}(w, t, x, w'') \rightarrow$
$\exists e[P(w'', e) \wedge Agent(w'', e, x) \wedge t <_{w''} \tau(e)]]$
(x intends at time t in world w to carry out an event e of type P)

b. $\neg Bel(w, t_{Utt}, x_{Spr}, \lambda w'[Intend(w', t', y, \lambda w''[\neg\exists e[P(w'', e) \wedge Agent(w'', e, y) \wedge t <_{w''\tau}(e)]])])$
(speaker's not believing that agent intends not to carry out an event e of type P)

The condition in (10b) is motivated by examples like those in (4). In (4a), suppose that we believe that Rebecca intends not to draw a square: the (positive) sentence is then false, because the condition in (10b) is not satisfied. This belief about Rebecca may arise because we also believe that she intends to draw a triangle—presumably Rebecca's intention to draw a triangle at that moment is incompatible with an intention to draw a square at the same time. In contrast to ability, it is arguably too strong to require that the speaker believe that the agent intends to carry out P, because the (positive) sentence in (4a) may be true even if the speaker believes that Rebecca does not intend to draw a square (note, moreover, that the agent's *not intending* to carry out P does not entail the agent's *intending not* to carry out P).

In sum, we define the assertive content of the progressive operator Prog as in (11), where 'End' denotes that (modally rigid) function which yields the final instant of intervals. Since not all events have agents, the speaker's belief of the agent's ability to carry out P and the speaker's not believing that the agent intends not to carry out P are relevant only when the event in progress has an agent. Although the presuppositional content of Prog as stated in (8b) is not officially represented in (11), it is nonetheless vital to the analysis of the progressive, as we have argued.

(11) $Prog(w, t_{Utt}, x_{Spr}, e, P(w)) \triangleq$ (assertive content of the progressive)
$Real(e, P) \wedge$
$\forall y[Agent(w, e, y) \rightarrow$
$Bel(w, t_{Utt}, x_{Spr}, \lambda w'[Able(w', End(\tau(e)), y, P(w'))]) \wedge$
$\neg Bel(w, t_{Utt}, x_{Spr}, \lambda w'[Intend(w', End(\tau(e)), y,$
$\lambda w''[\neg\exists e[P(w'', e) \wedge Agent(w'', e, y) \wedge End(\tau(e)) <_{w''\tau}(e)]])])]$

Our analysis is at once radical and conservative when compared with previous analyses of the progressive. It is radical in that it makes the roles of ability, intention, and the speaker's belief more explicit than in any other analysis that we are aware of. Also, the idea that the progressive involves a presupposition enables us to account for cases in which assertions lack a truth value—a phenomenon not treated by previous analyses. At the same time, the analysis is conservative in that it does not appeal to otherwise unmotivated and unanalyzed notions such as *inertia worlds* (Dowty 1979) or *reasonable options* (Landman 1992). Moreover, it suggests that the semantics of the progressive *per se* does not require the adoption of a *default logic* (Asher 1992) or the resources of *channel theory* (Glasbey 1996).

References

Asher, Nicholas. 1992. A default, truth conditional semantics for the progressive. *Linguistics and Philosophy* 15: 463–508.

Bach, Emmon. 1986. The algebra of events. *Linguistics and Philosophy* 9: 5–16.

Dowty, David. 1979. *Word meaning and Montague Grammar: the semantics of verbs and times in Generative Semantics and in Montague's PTQ*. Dordrecht: D. Reidel Publishing Company.

Gallin, Daniel. 1975. *Intensional and higher-order modal logic* (= *North-Holland mathematics studies*; 19). Amsterdam: North-Holland Publishing Company.

Gamut, L. T. F. 1991. *Intensional logic and logical grammar* (= *Logic, language, and meaning*, v. 2). Chicago: The University of Chicago Press.

Glasbey, Sheila. 1996. The progressive: a channel-theoretic analysis. *Journal of Semantics* 13: 331–361.

Kearns, Katherine Susan. 1991. *The semantics of the English progressive*. Cambridge, MA: MIT disseration.

Landman, Fred. 1992. The progressive. *Natural Language Semantics* 1: 1–32.

Vlach, Frank. 1981. The semantics of the progressive. *Tense and aspect* (= *Syntax and semantics*; 14), ed. P. J. Tedeschi and A. Zaenen, 271–292. New York: Academic Press.

The Dynamics of Discourse Situations (Extended Abstract)

Massimo Poesio Reinhard Muskens

1 Introduction

The shared 'conversational score' in a conversation does not consist only of information abo the propositional content of utterances. The participants in a conversation also share informatic about whose turn it is to speak, how what is being said fits in within the structure of the rest the conversation, and whether what has been said needs acknowledging (Clark, 1996). Thus, tl typical conversation consists not only of utterances performed to assert or query a propositio but also of utterances whose role is to acquire, keep, or release a turn, to signal how the curre utterance relates to what has been said before, or to acknowledge what has just been uttere (Poesio and Traum, 1997; Ginzburg, 1997). The linguistic tools used for these purposes inclu cue phrases such as *so* or (one sense of) *okay*; keep-turn signals such as *umm* or *wait*; and groun ing signals such as *okay* again, *right* or *huhu*. Bunt (1995) proposed for these utterances the ter DIALOGUE CONTROL ACTS.

Specifying the meaning of these expressions is a fundamental problem in the semantics dialogues. In keeping with the assumptions of theories of the common ground such as DI or DPL (Kamp and Reyle, 1993; Groenendijk and Stokhof, 1991), we are going to identify tl meaning of an utterance with the way it modifies the conversational score; on the other han the simplest (and arguably most natural) way of characterizing the meaning of dialogue contr acts is in terms of a theory in which the conversational score is seen as a record of the discour situation, or at least of the speech acts that have been performed. The problem we address in tl paper is how to reconcile a model of the conversational score in which the update potential these utterances can be specified with current views on how discourse entities become possib antecedents for anaphoric expressions.

2 The Basic Idea

A Simple Characterization of Discourse Situations

The effect of dialogue control acts is most naturally characterized in terms of a speech act-bas theory. As a result, the problem of specifying the meaning of the expressions used to perfor dialogue control acts was addressed in (Poesio and Traum, 1997) by proposing that the conv sational score consists of a record of the speech acts performed during the conversation, i.e., stripped-down characterization of what is called the DISCOURSE SITUATION in Situation Sema tics (Barwise and Perry, 1983). Furthermore, the approach adopted in (Poesio and Traum, 199 was to continue using the tools introduced in DRT to specify the content of the conversation score, treating speech acts just like any other ordinary event. For example, whereas the ordina DRT construction algorithm would assign to the text in (1) a DRS along the lines of (2), we h pothesize that the common ground in a conversation is more like (3), where we have adopted tl syntax from (Muskens, 1995).

(1) A: There is an engine at Avon.
B: *It* is hooked to a boxcar.